PAPER TRADE JOURNAL

JULY 6, 1944

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IS IT RIGHT TO TALK OR THINK OF PLANS FOR POST-WAR

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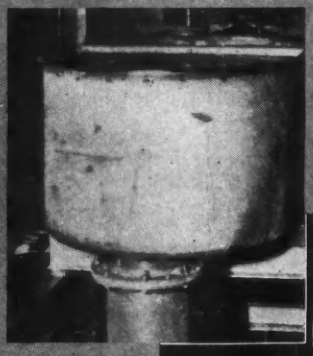

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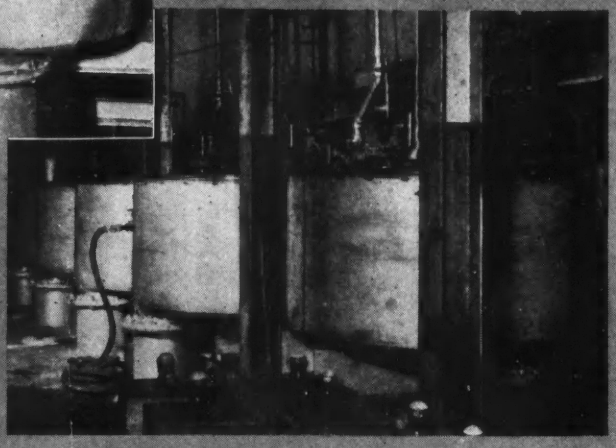

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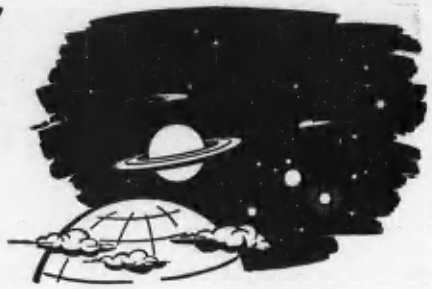

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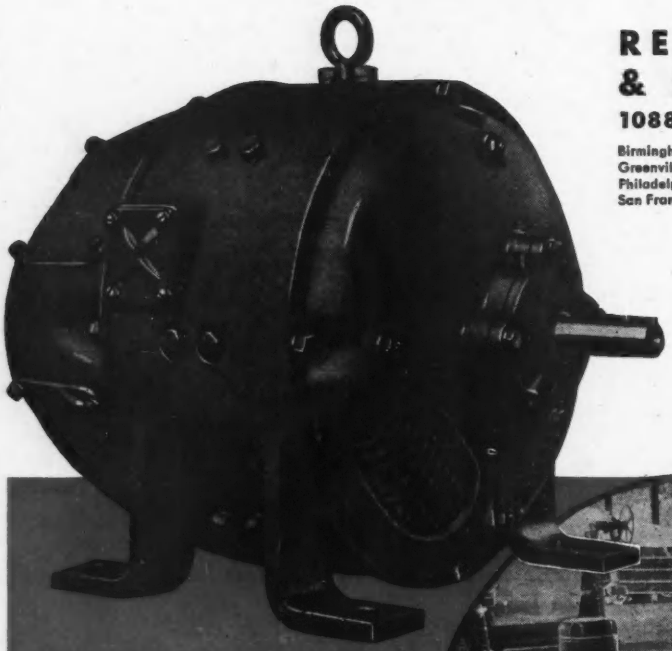

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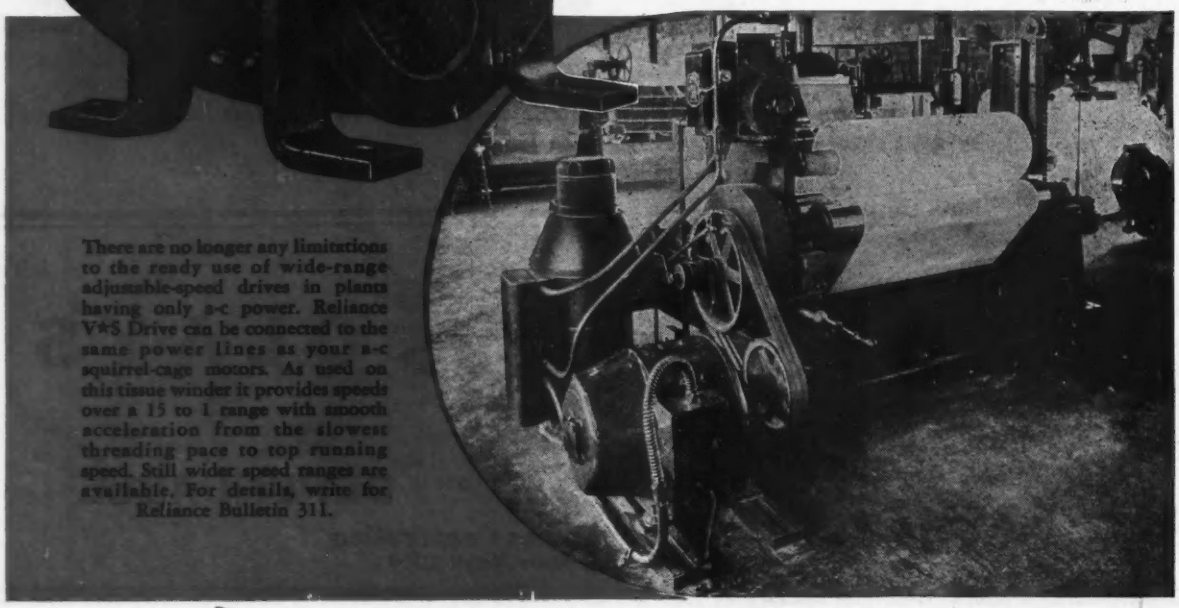

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Vol. 119, No. 1

PAPER TRADE JOURNAL

Title Reg. U. S. Pat. Off.

July 6, 1944

2,821,000 Tons Wood Pulp for Third Quarter

This Compares With 2,885,000 Tons For Second Quarter — WPB Estimates — This Will Provide For 4,341,637 Tons of Paper and Paperboard As Compared With 4,333,353 Tons In Second Quarter.

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., July 5, 1944—The total wood pulp supply available for use during the third quarter will be approximately 2,821,000 tons, compared with 2,885,000 tons for the second quarter, the War Production Board Pulp tAllocation Office reported last week, after a recent meeting with the Wood Pulp Industry Advisory Committee in Washington. Total domestic third quarter production is estimated at 2,547,000 tons and imports from Canada are expected to approximate 261,000 tons, in addition to which a seasonal withdrawal of 13,000 tons of pulp from inventory is anticipated.

After deduction of approximately 212,000 tons of wood pulp for export and for the manufacture of non-paper products requiring wood pulp, and allowing for increased use of waste paper, it is estimated that total paper and paperboard production for the third quarter will be 4,341,637 tons, compared with 4,335,353 tons in the second quarter.

Paper and Paperboard Groups Itemized

WPB released the following table itemizing the broad groups of paper and paperboard products with minimum programmed production in the third quarter and wood pulp use allocation for the third quarter.

Paper and Paperboard Products	Minimum paper and paperboard production third quarter	Authorized use of wood pulp third quarter (Preliminary)
Newsprint	180,000 tons	188,620 tons
Groundwood, Book, etc	478,550	344,674
Fine	222,550	170,497
Coarse (including wrapping paper & bags)	475,508	462,520
Shipping Sack	99,495	102,091
Special Industrial	59,861	53,476
Sanitary	206,531	201,891
Tissue	37,800	34,453
Absorbent	28,942	18,757
Building Paper	236,500	45,717
Containerboard	1,123,040	622,721
Folding Boxboard	507,555	118,543
Set Up Boxboard	182,380	1,076
Building Board	300,000	191,076
Cardboard	17,,000	5,912
Miscellaneous Board	185,925	37,409
Paper and paperboard total....	4,341,637 tons	2,599,343 tons

15 Per Cent Withheld

It was found necessary to withhold 15 per cent of the wood pulp production of integrated mills for distribution to the market in order to equalize the increased burden imposed upon the wood pulp economy for direct war requirements during the third quarter, WPB reported. In unbleached kraft wood pulp the withholding was even higher in some instances in order to provide sufficient market draft pulp for war and other essential purposes, it was said. Exceptions to withholding were made only where necessary in order to meet minimum production requirements for specific grades of paper and paperboard during the third quarter.

Non-integrated mills without supplementary fiber were authorized to consume during the third quarter sufficient wood pulp to give them an estimated minimum operation of 3½ days per week, unless additional authorization was necessary to meet the program requirements. Mills producing supplementary fiber were allotted the use of sufficient wood pulp to permit full utilization of their proposed production and use of supplementary fibre. Owing to greatly increased direct war requirements for both pulp and paper during the third quarter, the allocation of wood pulp for this period, according to WPB officials, will probably cause further curtailment in the supply of paper and paperboard for civilian uses.

A. Thomson Leaves Estate in Trust

CINCINNATI, Ohio, July 3, 1944—The will of Alexander Thomson Jr., vice president and advertising manager of the Champion Paper and Fibre Company, who died recently, was presented to Judge Frank S. Bonham in Probate Court.

Mr. Thomson, 35, became ill while serving with the American Red Cross in Egypt and had to resign last October. His home was on Laurel Avenue, Glendale.

His will, made March 18, 1943, gave all his household goods, automobiles, jewelry and other personal items to his widow, Adele N. Thomson, then ordered all the rest of his estate placed in trust with the Fifth Third Union Trust Co. as trustee under a trust agreement made Sept. 21, 1937, details of which were not revealed. He named the bank executor.

In a codicil dated June 14, this year, he decreed that all his interest in insurance policies on the life of his mother, Mrs. Mary M. D. Thomson, president of Western College, Oxford, O., in which he was named one of the beneficiaries, was to go to his widow. Thomson had two children, Adele L., 11, and Alexander Thomson III, 6.

Dismiss Sandy Hill Complaint

HUDSON FALLS, N. Y., July 3, 1944—Announcement is made that the National Labor Relations Board has dismissed a complaint against the Sandy Hill Iron and Brass Works concerning alleged unfair labor practices. The board ordered the company last spring to cease and desist from labor practices it found in the case of an employee who claimed he was transferred to an inferior job because he was active in promotion of self organization amongst employees. The company filed exceptions to the report and a hearing was held in June.

Midwest Expects Difficult Period Ahead

Paper Sales Executives Plan To Meet Exacting Allocation and Priority Restrictions In Coming Months — Salesmen Hear F.B.I. Expert — Paper Salvage Drive Discouraging — Other Late News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., July 3, 1944—A number of Chicago sales executives with headquarters in this city are at their mills this week attempting to evaluate allocation and priority changes in the light of their own customer experience and to make ready for what is expected to be the "toughest" quarter of the year. While extension of the privilege of increasing prices on the part of manufacturers if the situation merits it, was expected to get into most lines of paper in addition to coated and uncoated book papers, the local market felt that this "incentive" would be insufficient to do much to increase production. Manpower still continued to be the major factor according to local experts. The week showed most lines getting less goods for their civilian customers and in the kraft lines, in particular, conditions were reported to have grown definitely more grave.

Newsprint representatives were commenting on the report of a WPB Publishers Committee which has discouraged the use of thirty pound paper. One Chicago mill executive had a comment which indicates that this would actually mean a loss in production arising from the impracticability of using wood extension in making thirty pound newsprint plus manufacturing difficulties. A return to the 32-pound paper is hoped for.

Discouragement over the recent failure of the Chicago waste paper salvage drive is being forgotten as efforts are being made to "begin again" in city wide collection efforts.

Publicize Policy on Paper Saving

Chicago and Illinois retail merchants are evidencing a sincere desire to cooperate with the War Production Board in its new Declaration of Policy governing conservation of paper. Most Illinois retailers long ago adopted many of the "official" suggestions but comment indicated that they welcomed the publicizing of the over-all conservation program in the belief that it would help customers to appreciate why packaging and wrapping standards were so altered. The features of non-wrapping; use of consumer containers wherever possible; conservation of new wrapping and packing materials; avoidance of double wrapping and return of materials for re-use have all been a part of the State program for some time. The use of a "pledge" card in each store, cooperation in the use of advertising inserts telling of the importance of paper conservation and over-all community education programs are all expected to "take the sting" off of the conservation job. Much attention, it is reported, will be given to stressing the use of paper in the War effort—packing blood plasma, in making of munitions, et cetera—to expedite consumer acceptance.

Salesmen Hear F.B.I. Expert

A large number of paper sales executives and their guests were on hand at the Monday noon, June 26 meeting of the western division, Salesmen's Association of the Paper Industry, to get a first hand account of how money is counterfeited. The speaker at the special open meeting was Albert G. Zimmerman, special agent of the United States Secret Service. His subject was "Counterfeiting." Despite such other attractions as the Republican National Convention, the Sapeyes turned out in good numbers to follow, step by step, the methods used by counterfeiters to defy Secret Service agents. Mr. Zimmerman outlined the importance of knowing the paper, the watermark, the various chemicals and engraving and illustrated his talk with interesting moving pictures entitled "Know Your Money." The scope of counterfeiting, how it is being stamped out and the importance of cooperation on the part of the average citizen were all outlined along with the necessity of knowing what to look for to avoid loss through acceptance of counterfeit money.

According to "Pat" Patterson, Flambeau Paper Company, chairman of the western divison, the Association will not meet on July 3, holding its next regular meeting on July 10 at the Hotel Sherman.

Salvage Drive "Flops"

The most recent waste paper salvage drive in the Chicago area, held on Saturday, June 24, was described as a "colossal flop" by one Chicago paper board container manufacturer who, along with his associates, is becoming increasingly worried over the shortage situation. Slightly more than one fourth of the predicted collection of 3000 tons of waste paper was collected, according to W. H. Bennett, chairman of the campaign. This brings total collections up to approximately 818 tons. Keen disappointment at the low collection was expressed by waste paper dealers and members of the campaign committee. Urgent military orders for paper board containers for shells and blood plasma units face the makers, all of whom looked to the recent salvage drive to meet a considerable part of the army needs from a local standpoint.

Reasons for the "failure" ranged from lack of interest on the part of the public in general to a belief in some quarters that intensive localized school drives had skimmed the cream. There was no dearth of workers, particularly the Boy Scouts who labored untiringly in their appointed task.

Sues Waste Paper Firm

It is publicly reported this week that the Office of Price Administration has brought suit against the Thomas Paper Stock Company of Chicago. Charged with illegally collecting $194,000 in excess of legal prices in the sales of waste paper during the past year, the company will become the defendant in a suit for triple damages—amounting to $582,000—filed by the Chicago regional OPA office. It has been stated by Alex Elson, regional OPA attorney, that the company "concealed some of its price increases by billing purchases for fictitious cartage charges."

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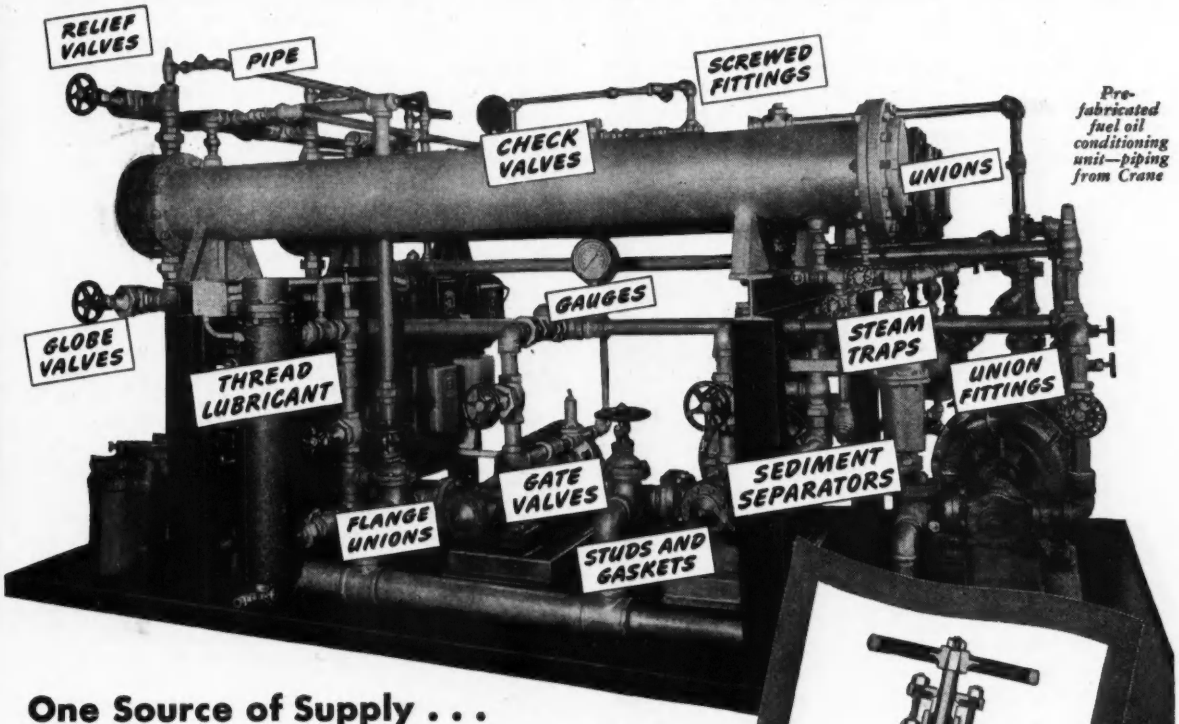

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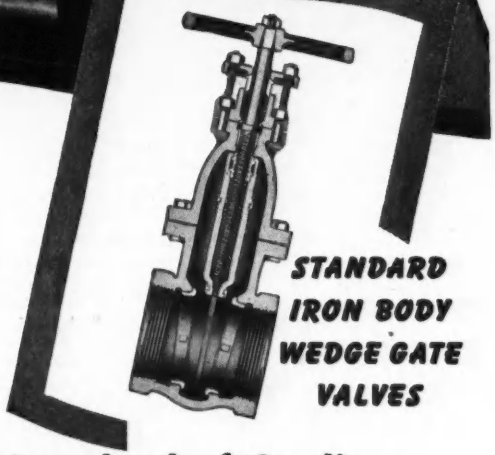

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Wausau Paper Mills To Start No. 4 Machine

Thirty More Workers Are Required To Handle Output of Paper Machine To Go Into Production For First Time Since Flood In 1941—John Strange Paper Co. To Rebuild—Other Industrial News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., July 3, 1944—The Wausau Paper Mills Company, Brokaw, Wis., will put its No. 4 paper machine back into operation as soon as possible, probably within the next two weeks, if formal approval can be obtained from the War Production Board.

Shut down since the flood of August, 1941, when the mill was damaged extensively from waters of the Wisconsin River, the machine has a daily capacity of from 30 to 35 tons. About 30 additional employees will be sought.

The company plans to use the machine to make wrapping papers and liner and container board, raw materials for which, to a very large degree, will consist of old corrugated boxes, mixed paper and other waste fiber material.

Wausau Paper Mills Company has concentrated its activities on its two large paper-making units since the 1941 flood, and has allowed the No. 4 machine to be idle, partly due to the limitation of orders by WPB and materials shortage, and partly because of its activities in carrying out an extensive rehabilitation program at its plant.

The program has included new wood processing facilities now in full operation, construction work having been done by C. R. Meyer and Sons Company, Oshkosh, Wis.

The other two machines are known as No. 1 and No. 3. With the production of No. 4, the total output will be in the neighborhood of 115 tons daily. Before the 1941 flood, the machines and other equipment were operated by electric power generated at the Brokaw plant, but they are now being run by purchased hydro-electric power, supplemented by electric power generated by steam at the Brokaw mill, the latter representing about 25 per cent of the total power used at the mill. The steam power was put into commission after the Brokaw power dam went out during the flood. An unused boiler plant at the mill was put into commission for this purpose.

Many Mills Closed on July 4th

Most paper mills and allied industries in Wisconsin will be closed July 4, except for repair and maintenance work, and many of them also were shut down July 3.

The Fox River Paper Corporation mills, Appleton, shut down Sunday, July 2, and will be closed through Sunday, July 9, with operations starting again Monday morning, July 10. Employes not eligible for vacation pay have been offered work for the week during which extensive repairs were to be carried on.

Riverside Paper Company, Appleton, closed Saturday and will reopen July 10. The office staff is having vacations Sunday, Monday and Tuesday.

Interlake division of the Consolidated Water Power and Paper Company, Appleton, closed most departments Wednesday of last week and will reopen July 5. Repairs are being made. The office staff had holidays Sunday, Monday and Tuesday.

Plant employes at Appleton Coated Paper Company, Appleton, are on a week's vacation, starting Sunday and continuing through July 9. The plant will reopen for production on July 10. The office staff is not working Sunday, Monday or Tuesday.

Because of curtailment of wallpaper production, the Atlas mill of Kimberly-Clark Corporation at Appleton has been operating with a skeleton crew, but expects to be back on a 60 per cent production schedule September 1. The mill is closed down the first three days of this week.

The Appleton Wire Works and Tuttle Press Company will be down July 4 only, while the Wisconsin Wire Works, all of Appleton, Friday night until July 5.

Badger Globe and Lakeview mills, Neenah, of Kimberly-Clark Corporation closed with the last shifts Monday, to resume work Wednesday morning, and the Kimlark mill was down both days.

The entire Kimberly mill, with exception of the chlorine, steam, electric, vulcan power house departments were down July 3 and 4 to resume Wednesday. Maintenance and other service departments, however, performed necessary work on Monday.

Industries must plan as carefully to resorb returning servicemen into their organizations as they plan for reception of supplies and raw materials, S. F. Shattuck, vice president of Kimberly-Clark Corporation, Neenah, told 50 men who attended a luncheon meeting Thursday noon, June 29, of the Appleton Chamber of Commerce at Conway hotel, Appleton.

Mr. Shattuck stressed the fact that the problem is mainly one for the community and for industry. "After years of intensive, highly-keyed and dangerous living overseas, the problem of adjustment to normal civilian life will be a difficult one," he said. "What these returning men want and need and deserve is a job to assure them a decent self-respecting place in society."

He said that about 100,000 men are being discharged monthly and that "fairly soon" after the end of the European campaign from 2 to 2½ million men will be demobilized.

John Strange Paper Co. To Rebuild

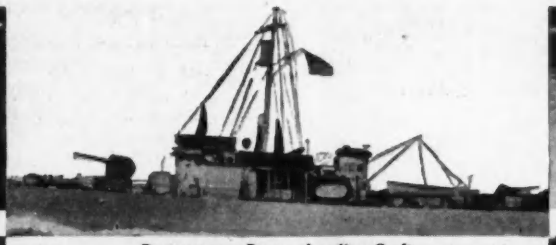
Officials of the John Strange Paper Company, Menasha, Wis., announced July 1 that construction of a building to replace one destroyed by fire on June 13 is expected to start within two weeks.

It will duplicate the foundation size of the ruined building, and will be a 2-story structure of brick, concrete and steel. The first floor will house a recreation room, store room and finished paper stock room. The second floor, which will not project the entire length of the building but only 25 percent of the distance, will house the company offices and laboratory.

Joseph H. Levandowski, assistant manager, said the company expects to erect another building at the east end of the mill for storage purposes.

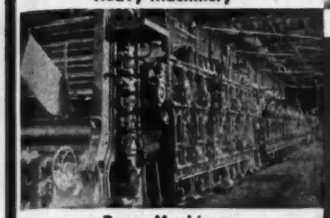
The first-mentioned building is expected to be completed and ready for occupancy within four months.

Heavy Machinery

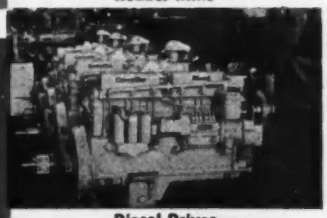


Destroyers — Tugs — Landing Craft

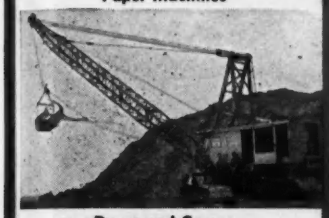
Rubber Mills



Paper Machines



Diesel Drives



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Since the fire, temporary offices have been set up in the Lux building on Tayco street. Exact damages are expected to be determined the week of July 9.

Mills Re-Employ Service Men

Kimberly-Clark Corporation has reinstated 7% of its former employes with honorable discharges from the armed forces. The corporation has 1,550 in the armed services, and 109 of them have gone back on the payrolls.

The Gilbert Paper Company, Neenah, has 60 men in the service, and 3 have returned to the firm.

Eleven of the 460 former employes of the Menasha Products division of the Marathon Paper Mills Company who are in the armed forces, have received honorable discharges, and 10 of them are back with the concern.

Only one former employe of the Neenah Paper Company has returned from service and has been rehired. The company has 49 on its honor roll.

The Whiting Paper Company has 12 men in the service. One has been given an honorable discharge, but he did not ask reinstatement, having accepted another job.

Is National Model for Paper Salvage

Results accomplished in the world's tallest building during an intensive one-month paper salvage campaign have provided the blueprint for a special nationwide effort to send more waste paper to war, War Production Board officials announced in New York, following tabulation of collection totals during the 30-day test drive.

Paced by salvage contributions of the Empire State Building's largest individual space-using tenant, Schenley Distillers Corporation, whose nine floor offices alone turned in 14½ tons of waste paper in excess of normal, collections for the month totaled 238,695 pounds, the WPB reported. Of this 119 ton total, sufficient to provide more than 1½ million Ration "K" cartons or 476,000 extra blood plasma containers, 60½ tons was excess waste brought out of files, desk and storerooms in the four-week period. The "per capita" average of salvage for individuals making up the skyscraper's vast business population was estimated at 20 to 24 pounds each.

With the shortage of paper currently constituting the most pressing war material supply problem, the Empire State program planned and directed by John J. Hennessy, Schenley's coordinator of civilian defense activities and air raid precaution chief for the building, will be used as a model for similar intensive campaigns to be launched immediately in other of Manhattan's more than 1,000 large office buildings.

The collection plan worked out by Hennessy included intensive floor-by-floor, office-by-office organization, supplemented by a check system of individual pledges, poster and bulletin reminders, and a building lobby chart showing the daily competitive record of individual floors.

J. R. Halkyard Made Asst. Manager

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., July 3, 1944—John R. Halkyard has been appointed assistant general manager of Carter Rice Company Corp. He will continue as sales manager of the wrapping paper and industrial paper department of that company.

Virginia Cellulose Changes

WILMINGTON, Del., June 26, 1944—Two personnel changes in the Virginia Cellulose Department, Hercules Powder Company, effective immediately, are announced by Lloyd Kitchel, general manager of the department.

They are: Elmer F. Hinner, to be assistant general manager, and Charles H. Lickle, who was appointed manager of cellulose purchases.

Mr. Hinner, who is married and lives in Claymont, Del., has been with Hercules 17 years, having joined the experimental staff as a chemist after graduating from Penn State in 1927. He was stationed at the Hopewell (Va.) chemical cotton plant as a research chemist and was later promoted to plant trouble

ELMER H. HINNER CHARLES H. LICKLE

shooter and assistant superintendent, prior to being transferred to sales and operations in the Virginia Cellulose Department at the home office. He is a member of the American Chemical Society and the Technical Association of the Pulp and Paper Industry.

Mr. Lickle, who is married and lives in Wilmington, has been a Hercules employee for 28 years in the company's Purchasing Department and Virginia Cellulose Department. He is recognized as an authority on cotton linters here and abroad.

Publishers Consider Conservation

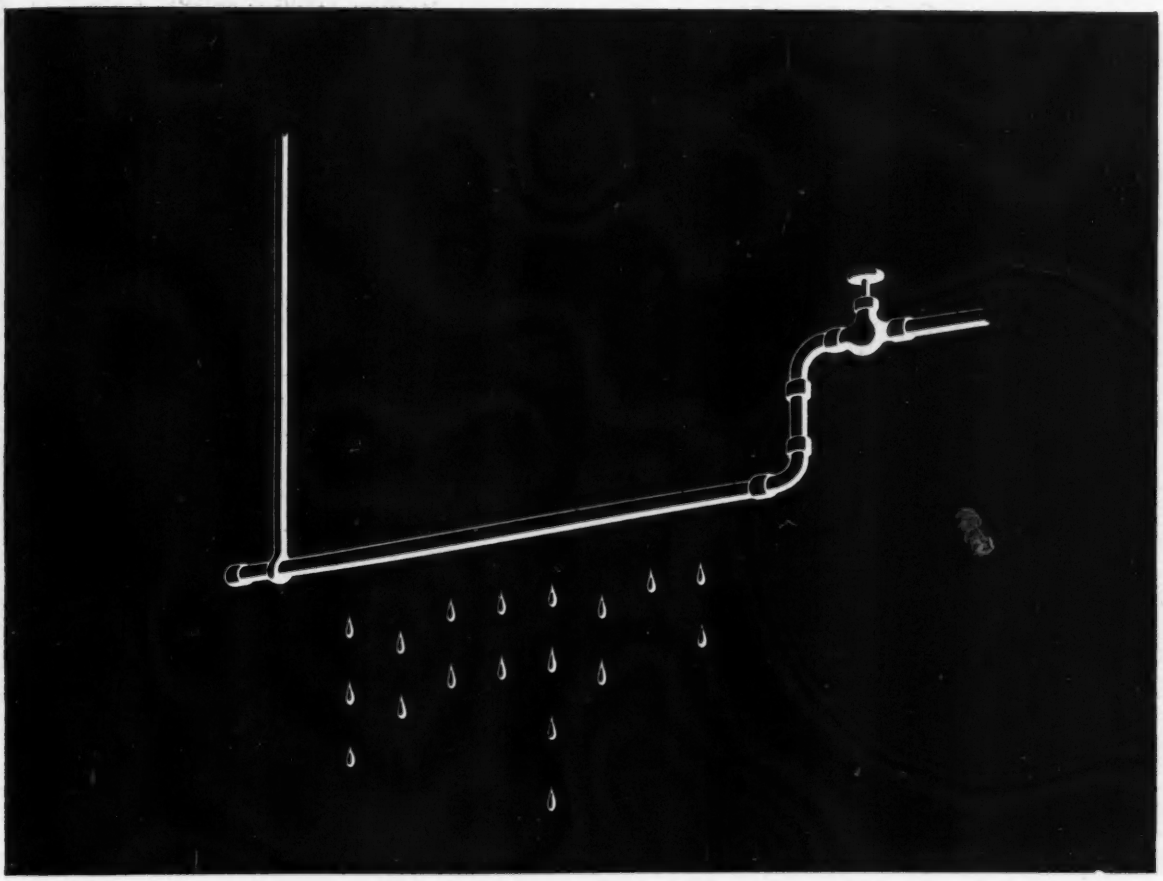
John W. Potter, publisher of the Rock Island, Illinois, Argus, has been appointed chairman of a subcommittee of the WPB Newspaper Industry Advisory Committee with the assigned task of "considering the matter of the contributions by the smaller newspapers to the over-all newsprint conservation and make recommendations to the full advisory committee as to the comparative percentages of reduction in the usage of newsprint by the lower tonnage bracket of the industry." Mr. Potter is also member of a committee of five to study "thin papers" or newspapers with small news content such as tabloids and small-town newspapers and report to the industry committee.

Rules on Uncoated Book Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., July 5, 1944—Uncoated book papers, supercalendered, may now be manufactured for use in making labels in a 50-pound weight basis instead of 45 pounds, the Paper Division of the War Production Board said today.

An amendment to Schedule I to Limitation Order L-120, issued today, corrects the maximum basis weight for seed packetpaper to read 65 pounds.



As simple as this to preserve laps

All that is required to preserve laps in the average pulp mill is a gadget like that shown above: a perforated pipe, a control valve and a suspended tank to gravity-feed a solution of "Lignasan" on the sheets as they pass over the wet machine.

"Lignasan" contains *ethyl mercury phosphate,* one of the most powerful fungicides and bactericides known. It is extremely effective even in low concentrations against slime-producing bacteria, as well as fungi that cause pulp to rot. As little as 3 to 5 ounces per ton of fiber, dry basis, is usually sufficient to prevent growth of profit-stealing slime on the paper machine.

Added at the beater in powder form, "Lignasan" may be generally counted on to control slime throughout the entire "wet" paper making processes. Or, it may easily be fed in solution as a spot treatment into the system at any point where slime habitually occurs.

Protect stored laps and slush pulp too, with "Lignasan." From 4 to 8 ounces per ton of fiber, dry basis, offer protection against spoilage.

Get the facts today on how "Lignasan" can help increase production and cut costs in *your* mill. Write our nearest office or E. I. du Pont de Nemours & Co. (Inc.), Grasselli Chemicals Department, Wilmington 98, Delaware.

CONTROLS SLIME
PRESERVES PULP

Du Pont Lignasan

REG. U. S. PAT. OFF.

BACTERICIDE AND FUNGICIDE

DU PONT

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

Obituary

Ralph J. Schoettle

Funeral services were held on Saturday last for Ralph J. Schoettle, retired president of the Schoettle Paper Box Company, in the Church of the Sacred Heart, Bay Head, N. J. Private burial was made in Laurel Hill Cemetery.

Mr. Schoettle, 65, died of a stroke Wednesday at his summer home at Bay Head.

Active in Boy Scout work for 25 years, he was a special national field commissioner of the Boy Scouts of America. He was instrumental in organizing Boy Scout troops in Catholic churches and institutions throughout the country with the cooperation of the clergy. He was committeeman for Boy Scout Troop 207, of St. Vincent de Paul's Church, Price street, Germantown.

Mr. Schoettle also was an organizer and president of Boys' Pals of Philadelphia, Inc., an organization founded 10 years ago by men interested in aiding underprivileged children.

The honorary degree of Doctor of Laws was conferred on him by La Salle College in 1937, of which school he was an alumnus. He also attended Fordham University.

A native of Germantown, and unmarried, he retired from business more than 10 years ago to devote himself to boys' work.

He is survived by two brothers, William C. and Edwin J., and a sister, Miss Alice Schoettle.

William J. McGarity, Jr.

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., July 3, 1944—News of the sudden death of William J. McGarity, Jr., 39, president of the Penn Paper and Stock Company, 910 Brown street, cast a pall of sadness among his friends here in Philadelphia. Mr. McGarity, who was spending the summer with his wife, Mari, at Margate, N. J., was driving alone when he lost control of his car during a blinding rain storm on Saturday last. His car skidded, leaped the curb and crashed into the side of a house. Mr. McGarity was unconscious when police arrived, and died in Atlantic City Hospital of a skull fracture.

The body will be returned to Philadelphia for burial, but at this writing the funeral arrangements had not been completed.

Mr. McGarity lived at the Drake Hotel, 1512 Spruce street, Philadelphia.

Charles Edgar Beatty

Charles Edgar Beatty, 66, a widely and favorably known salesman for John Carter & Company, Inc., Boston, died June 30 at the Newton Hospital, Newton, Mass., after a brief illness. He had been associated in the paper business for more than 40 years, the last 25 years with that firm. Mr. Beatty was one of the earliest graduates of the Massachusetts Nautical Training School and was Boston city councilman from Dorchester in the early 1900's. His residence was at 12 Winchester road, Newton.

His wife, Mrs. Gertrude (Kendall) Beatty; a son, Charles K. Beatty of Wellesley, and a daughter, Mrs. Stanley E. Clark of Wellesley, Mass., are living. Funeral services were held July 3 at Newton Cemetery Chapel.

Maj. Victor I. Safro

Major Victor I. Safro died May 24, at Mitchell Field Hospital, Hempstead, Long Island, N. Y., after voluntarily submitting to a serious operation rather than accept a physical discharge from the Army Air Force.

Major Safro served in World War I as a lieutenant in the Air Corps. He was a graduate of Cornell University and for many years served in the capacity of entomologist on the Board of the Natural History Museum of New York City. His last position with Wyandotte Chemicals Corporation was manager of the calcium carbonate department.

Orienting the New Worker

One important factor in good morale is the orientation of the new employee, according to a new report, "Orienting the New Worker," prepared by the Policyholders Service Bureau of the Metropolitan Life Insurance Company. This is especially true during wartime when great numbers of workers are entering new occupations—many of them women who have never worked before. Realizing that an employee's first impression of the company he is to work for is important, management today is devising ways and means of making him feel at ease.

According to this study, the aims of any program of orientation are to give the new worker confidence in himself and the company, to make him feel that the company is interested in him and will treat him fairly, that his fellow workers and his supervisor are glad to have him in their department and that he will like his job and have a chance to get ahead.

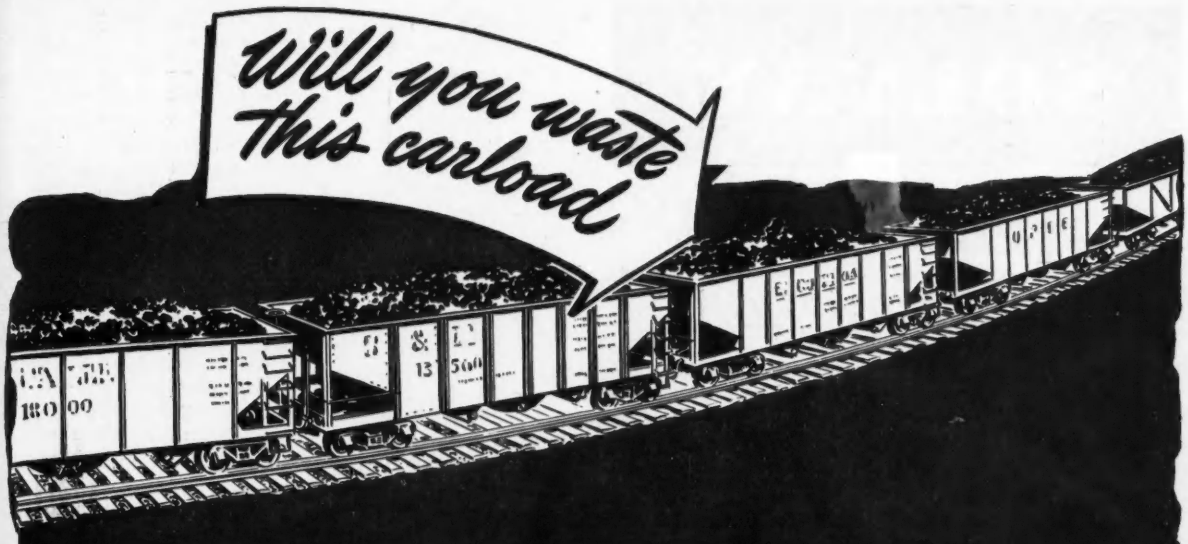
The hiring process should establish friendly relations with the applicant, get from him information which will aid in placing him and give him the information he needs about the company and the job for which he is hired. The techniques followed by several companies are outlined in the survey. Induction classes may be used to spread the induction process over a period of time and combine induction training with work. The vestibule school presents an opportunity for the new employee to get acquainted with factory routine and with factory machines.

To refresh his memory on matters of immediate importance to him, such as transportation, eating facilities, benefit plans, and other company programs, an employee handbook may be given to the new worker or a special type of booklet prepared for the purpose of welcoming the newcomer. The complete schedules of two companies in the orientation of new employees are presented as an appendix to the report.

Copies of this study will be sent to executives who address the Bureau on their business stationary. Address: Policyholders Service Bureau, Metropolitan Life Insurance Company, 1 Madison avenue, New York 10, N. Y.

DeWitt Thompson Made Lt. Commander

DeWitt Thompson, formerly assistant general manager of sales for The Mathieson Alkali Works and a past president of the Salesmen's Association of the American Chemical Industry, has been promoted to Lieut. Commander in the U. S. Naval Reserve. He joined the Navy in 1942, on leave of absence from Mathieson, with the rank of Lieutenant (s.g.) U.S.N.R., and is now in service at the Naval Air Station, Terminal Island, Cal.



Reduce Fuel and Power Costs

by

W&T Chloramine Treatment

Besides the damage to material in process and to finished stock caused by slime bacteria, their growth in mill water raises both fuel and power costs.

So scores of paper mills are using the Wallace & Tiernan method of chloramine treatment to prevent power losses occasioned by slime growths partially obstructing stock and white water lines, and clogging filter beds in the fresh water filter plant.

This W&T chloramine treatment also eliminates the "waterproofing" effect of slime in paper machine felts, which hinders water removal over suction boxes or suction rolls and through press rolls. Excess water places an additional load on the dryers and occasions an unnecessary fuel loss.

Finally, by preventing the formation of slime accumulations on surfaces of heat exchange units, slime removal saves fuel by increasing heat recovery.

Write for technical information regarding W&T chloramine treatment.

W&T CHLORAMINE TREATMENT
For Slime Removal and Microbiological Control

1. Lowers Stock Loss
2. Cuts Fuel and Power Costs
3. Minimizes Shutdowns for Clean-Ups
4. Prolongs Equipment Life
5. Reduces Time Loss from Breaks
6. Ends Slime Spots—Protects Quality

WALLACE & TIERNAN COMPANY, INC.

MANUFACTURERS OF CHLORINE AND AMMONIA CONTROL APPARATUS
NEWARK 1, NEW JERSEY • REPRESENTED IN PRINCIPAL CITIES

P-49

SOLVAY*

...KEYED TO TODAY AND TOMORROW

Today... Solvay's large facilities are supplying alkalies which are used in the over-all requirements for the mass production of pre-fabricated war housing. In the history-making months to come, Solvay will continue to make its important contributions to the war with highest quality alkalies and related products.

Tomorrow... New housing methods will offer a healthy, more enjoyable way of life to people everywhere. Solvay, with its broad background of long experience and continuous research, will keep in step with all new housing developments—supplying quality alkalies to America's great industries.

SOLVAY

*The Solvay Process Company employs salt, limestone and ammonia to make Soda Ash; from which basic material Caustic Soda and other alkalies are derived

SODA ASH
AMMONIUM BICARBONATE
AMMONIUM CHLORIDE
PARA-DICHLOROBENZENE
CAUSTIC POTASH

CHLORINE

CAUSTIC SODA
POTASSIUM CARBONATE
SODIUM NITRITE • SALT
CALCIUM CHLORIDE
MODIFIED SODAS

SOLVAY SALES CORPORATION
Alkalies and Chemical Products Manufactured by The Solvay Process Company
40 RECTOR STREET NEW YORK 6, N. Y.

Raises Price on Rotogravure Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., July 5, 1944 — The ceiling price of manufacturers for supercalendered groundwood rotogravure, which is used for newspaper rotogravure sections, mail order catalogues and other periodicals, has been increased 42½ cents per hundredweight, the Office of Price Administration announced today.

This increase, which is effective July 10, 1944, raises the maximum price to $4.75 per hundredweight. The increase will be absorbed by the publishers who buy the paper. None of this paper is sold at the retail level, and hence the public is not affected by the change.

The increase has been granted because current costs have risen to the point where the existing ceiling price results in a substantial loss per ton for all manufacturers, and higher prices prevail for available substitutes, OPA said.

The higher price should enable manufacturers to recover approximately their total costs and encourage continued production of this type of paper, OPA said.

Occupancy Tax in New York Due July 15

Almerindo Portfolio, New York City treasurer, announced that the Occupancy Tax for 1944 is due on or before July 15. The treasurer advised that remittances postmarked after midnight July 15 are subject to penalties.

Mr. Portfolio pointed out that the tax applies to every occupant of rented premises or of space used for a gainful purpose within the City of New York for a period of one month or more since July 15, 1943, and is based on the annual rental value of the premises occupied.

The treasurer explained, however, that premises occupied by the title owner thereof are not subject to the tax. Exemption is also granted to governmental agencies and charitable, religious and educational organizations.

Checks and money orders should be made payable to the City Collector and addressed to the office of the Bureau of City Collections in the borough in which the taxpayer has his principal place of business.

Penn. Salt to Open Ohio Office

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., July 3, 1944 — The Pennsylvania Salt Manufacturing Company announces that it will open a district sales office at Cincinnati, Ohio, in the Carew Building to serve the territory including southeastern Indiana, southwestern Ohio, and the major part of Kentucky.

Louis N. Kuilema, who has been appointed district sales manager in charge of the office, was formerly with the Paper Makers Chemical Department of the Hercules Powder Company and has been in the executive offices of that company in Wilmington, Delaware, for the past seven years. Kuilema is a native of Kalamazoo, Mich., and attended Kalamazoo College and Western Michigan College. He is married and has two children. Before his entrance into the chemical business, Kuilema had been associated with the U. S. Pressed Steel Products Company and the Kalamazoo Stove Company.

THROW MOLD OUT FOR KEEPS!

Mold costs money. Don't feed it by permitting the existence of conditions that promote its growth . . . throw it out for keeps. No matter what your problem, in this respect, one or more of the Dowicide family of seventeen products is ready to help you in two ways . . . to bolster the resistance of the finished product against fungi and bacteria . . . to prevent malicious growth during processing.

Dowicides are economical . . . thoroughly tested . . . proved by years of industrial acceptance.

In the paper industry, Dowicides have proved their value in several ways:

First, they protect stock from spoilage due to mold attack during processing or in storage.

Second, they can be incorporated into the product to produce mold-resistant papers, for wrapping many materials having a high moisture content such as soap.

Third, they lengthen felt life by combatting mold attack.

Fourth, they are effective adhesive preservatives.

Dowicide products are economical . . . effective . . . easy to apply. For further information on how to throw mold out for keeps, write to the Dowicide Division.

THE DOW CHEMICAL COMPANY

MIDLAND, MICHIGAN

New York • Boston • Philadelphia • Washington • Cleveland
Detroit • Chicago • St. Louis • Houston • San Francisco
Los Angeles • Seattle

DOWICIDE

GERMICIDES AND FUNGICIDES

Among the many Dow products serving the Paper Industry are: Methocel, Ethocel and Caustic Soda.

DOW

CHEMICALS INDISPENSABLE TO INDUSTRY AND VICTORY

Instrumentation Studies. XLVII*

The Measurement of the Stretch of Paper

By Staff of The Institute of Paper Chemistry

Continued from Issue of June 29, 1944

Clark Stretch Tester

The Clark stretch tester *(10)* operates upon a principle quite different from that of any of the instruments mentioned above. It is shown in Fig. 9. The specimen is fastened between the two clamps at the top of the instrument. The cylindrical sleeve projecting out to the left of the left-hand clamp covers a compression spring which controls the initial tension in the specimen. Initially, the vertical plunger is drawn down so that it does not touch the horizonal specimen. When the plunger is cranked up, it meets the mid-line of the specimen at right angles to the length of the specimen and, upon being forced up still further, it deforms the specimen into a shallow inverted V which becomes steeper and steeper as the plunger continues to move up. Eventually, the stress on the specimen is sufficient to break it. The linear separation of the clamps is constant, so that the elongation of the specimen may be calculated from the vertical displacement of the mid-line from its initial position. This displacement is measured by a vernier on the plunger. The details of the vernier and its release mechanism are shown in Fig. 10. The main scale is engraved on the plunger and is divided into twentieths of an inch. The vernier scale of five divisions is marked on a rod which slides in a groove in the plunger. The displacement of the plunger may thus be read to hundredths of an inch. Until the specimen breaks, the vernier rod is held stationary by the horizontal bar (Fig. 10) attached to the left-hand clamp. This bar projects slightly over the top of the vernier rod when the clamp is pulled over to a stop during the initial tensioning of the specimen. The scale reads zero just as the plunger touches the specimen. When the specimen breaks, the compression spring forces the clamp to the left and disengages the bar from the top of the vernier rod, so that the rod then moves with the plunger and no further displacement of the vernier scale with respect to the main scale occurs.

* This report is one of a series issued as a part of the instrumentation program of the American Paper and Pulp Association.

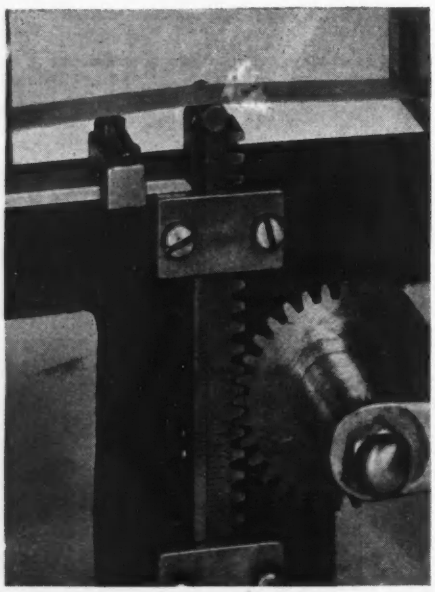


FIG. 10
Detail of Clark Stretch Mechanism

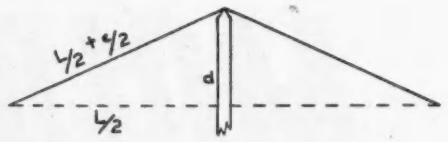


FIG. 11
Relation of Elongation to Plunger Displacement

The relationship between the displacement *(d)* of the plunger, the original length *(L)* of the specimen, and the elongation *(e)* is illustrated in Fig. 11. Considering the right triangle formed by the clamp, the plunger, and the original half length of the specimen, the application of the Pythagorean theorem yields the following relationship between the sides of the triangle:

$$(L/2 + e/2)^2 = d^2 + L^2/4.$$

The following equation for e results upon extracting the square root of both sides of the above equation and solving:

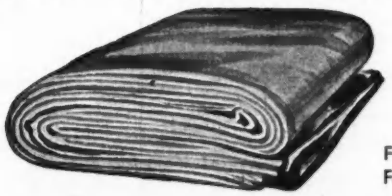
$$e = 2\sqrt{d^2 + L^2/4} - L.$$

In actual testing, of course, the formula would not be used for each calculation, but a table would be made up from which the elongation and stretch corresponding to every possible value of the plunger displacement, d, could be read for specimens having any of the three lengths, 4, 6, and 8 inches, for which the instrument may be used.

The actual operation of the instrument during a test is as follows: The head and tail block which carry the clamps are placed in position for the desired test length. A screw and two dowel pins locate each block in any one of three positions. The blocks should, of course, be placed symmetrically with respect to the plunger. The specimens are cut 15 mm. wide and of appropriate length. The specimen is slipped through the right-hand clamp and is inserted and fastened in the left-hand clamp. The free end of the specimen which projects beyond the right-hand clamp is grasped and, with the plunger in its extreme downward position, it is pulled until the left-hand clamp reaches its stop and the bar has engaged the top of the vernier rod. The compression spring behind the left-hand clamp is adjusted to demand a tension of 1 kilogram for this operation. The specimen is so held while the right-hand clamp is tightened. The crank is then turned to thrust the plunger upward until the specimen breaks. The scale reading is made before the crank and plunger are returned to their starting positions, as the vernier is automatically returned with the plunger.

The "Limited" makes the run from New York to Chicago in 17 hours, with only 3 station stops on the way. The "Fast Mail" makes the same run in 25 hours, with 24 station stops *en route*. The actual *running* time of both trains is about the same. Stops and starts account for the 8 hours lost by the "Fast Mail."

Substitute tonnage for mileage and you will have a true yardstick for measuring the relative production of two paper machines. The machine that is equipped with a Hamilton Felt can be run at top speed because every Hamilton Felt removes water very fast, thereby reducing the time required at the drier rolls. Equally important, every Hamilton Felt is completely and evenly shrunk before it goes into service. Consequently Hamilton Felts ride the rolls as smoothly as the "Limited" rides the rails — without frequent stops for adjustment.



From the thinnest tissue to the heaviest board there is a Hamilton Felt that will do your work better, faster and at lower cost.

SHULER & BENNINGHOFEN, HAMILTON, OHIO

• Miami Woolen Mills •

Hamilton Felts

• Established 1858 •

Calibration of Stretch Testers

All tensile and stretch testers are required to have clamps whose gripping edges are parallel and which grip the specimen uniformly across its width so that the stress is properly distributed across the specimen. One general indication of improper clamping is the frequent occurrence of specimen failures at the clamps. Of the four instruments studied in this program, the Schopper, Scott, and Clark instruments were satisfactory in this respect. The movable jaw of one clamp of the Amthor instrument initially required shimming in order to make the clamping pressure satisfactorily uniform.

An examination of the accuracy of calibration of the scales of stretch testers is a relatively simple matter. With all instruments in which the specimen is straight throughout a test, a highly extensible material, such as rubber, may be used as a specimen and the actual clamp separation measured with calipers and rule for each of a series of relatively large elongations and compared with the corresponding scale readings. Since the scales are linear for instruments of this type, the accuracy of subdivisions within these large steps may be checked with dividers and rule. The linear displacement scale of the Clark instrument is easily checked against a rule. The only other features of importance in the calibration of this instrument are the requirements that the clamp separations actually be the nominal values and that the vernier read zero just as the plunger touches the paper. If the scales are found to be improperly divided, a calibration curve may be drawn from which the true elongations corresponding to the scale readings may be taken.

Amthor Universal Tensile Strength Tester

The elongation scale of the Amthor instrument is divided into marked units of 0.1 inch, which are subdivided to 0.02 inch so that elongations can be estimated to 0.005 inch. The stretch scale is marked in units of 2%, which are subdivided to 0.2% so that estimates can be made to 0.05%.

The elongation scale of this instrument was checked by the rubber band technique suggested above. A heavy rubber band was clamped in the jaws and put under some tension. The clamp separation was measured with vernier calipers, and the elongation scale pointer was set at zero. An elongation of approximately 0.5 inch was produced, the elongation scale reading was taken to the nearest 0.005 inch, and the clamp separation was measured with the calipers. Similar observations were made for elongations of about 1 and 1.5 inches. Table I lists the elongations obtained from the caliper measurements and those read from the scale.

As a check on the internal consistency of the scale, the accuracy of subdivision of the elongation scale was examined by measuring the straight line distances between consecutive 0.1-inch divisions on the scale. Dividers were used and measurements were made to the nearest 0.01 inch. The values are recorded in the second column of Table II. The variations in the spacings seemed large enough to demand further study. The cumulative sums of these distances are

TABLE I—COMPARISON OF MEASURED AND INDICATED ELONGATIONS ON THE AMTHOR TESTER

Scale Reading, in.	Measured Elongation, in.
0.505	0.497
1.010	1.008
1.495	1.474

TABLE II—COMPARISON OF CALCULATED AND INDICATED ELONGATIONS AND PERCENTAGE STRETCHES ON THE AMTHOR TESTER

Elongation Scale Reading	Measured Difference, in.	Cumulative Difference in.	Calculated Elongation, in.	Calculated Stretch, %	Stretch Scale Reading
0		0	0	0	0
0.100	0.49	0.49	0.100	1.67	1.62
0.200	0.52	1.01	0.206	3.43	3.35
0.300	0.48	1.49	0.304	5.07	5.00
0.400	0.50	1.99	0.406	6.77	6.63
0.500	0.48	2.47	0.504	8.40	8.35
0.600	0.48	2.95	0.602	10.0	10.0
0.700	0.47	3.42	0.698	11.6	11.6
0.800	0.50	3.92	0.800	13.3	13.4
0.900	0.48	4.40	0.898	15.0	15.0
1.000	0.50	4.90	1.000	16.7	16.8
1.100	0.48	5.38	1.098	18.3	18.4
1.200	0.48	5.86	1.197	20.0	20.0
1.300	0.53	6.39	1.303	21.7	21.8
1.400	0.47	6.86	1.400	23.3	23.3
1.500	0.52	7.38	1.506	25.1	25.0

shown in the third column of Table II. From Table I, it is seen that the elongation scale was satisfactorily accurate at the reading near 1.00. Therefore, assuming the cumulative sum of 4.90 from the third column of Table II to be the proper value for the scale reading 1.00, the elongations corresponding to the other listed scale divisions were calculated by dividing each item in the third column of this table by 4.90. These calculated values of the elongation are listed in the fourth column of Table II. The values of percentage stretch for a 6-inch specimen corresponding to these calculated elongations were determined and are presented in the fifth column of the table. The stretch scale readings (for a 6-inch specimen), corresponding to the elongation scale readings of the first column, are listed in the last column of the table.

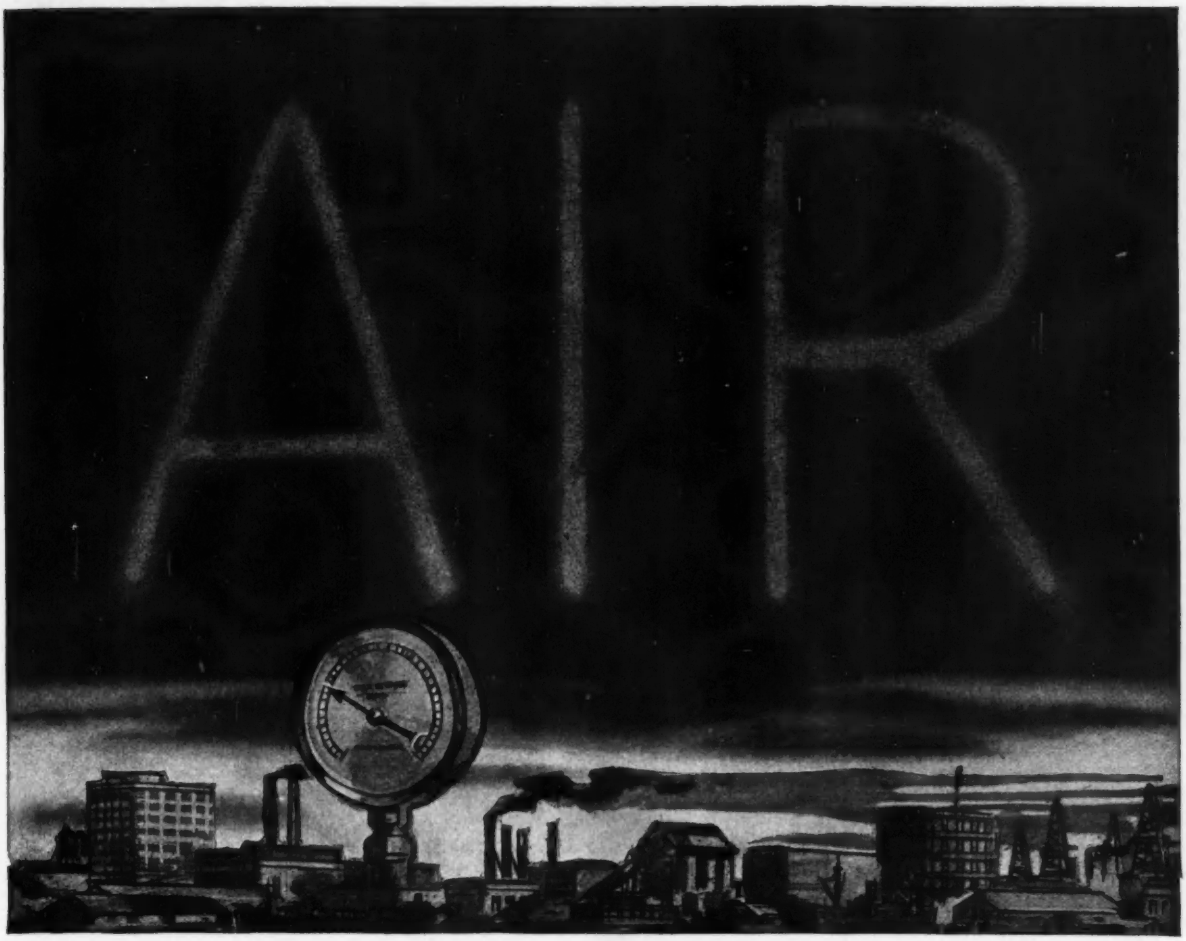
The indicated and calculated elongations agree to 0.01 inch in spite of the nonuniform division of the scale. This agreement is satisfactory. The tentative TAPPI method for stretch *(5)* considers 0.02 inch to be a satisfactory accuracy of calibration. The indicated and calculated stretches agree to 0.1 point. The scales of the instrument, therefore, show proper internal consistency.

Schopper Electrically Driven Strength Tester

The elongation scale of this instrument is divided into units corresponding to 1/32-inch elongations. The full scale corresponds to an elongation of 1 inch; the ⅛-inch divisions are marked. The percentage stretch scale is constructed for an 8-inch specimen and covers the range from 0 to 15% stretch. The 1% divisions are numbered and subdivided into divisions corresponding to 0.2% stretch. The elongation scale would be much more convenient to read if it were decimally divided, and there appears to be no good reason why it should not be so divided.

The internal consistency of the elongation scale was examined by the rubber band technique described above, and the measured and indicated elongations differed by only 0.001 inch at half and full scale elongations. The uniformity of the divisions of the scale corresponding to ⅛-inch elongation was tested with dividers and rule and found to be within 0.01 inch. The 1% divisions of the percentage stretch scale were equally uniform, and the 1-inch mark on the elongation scale coincided with the 12.5% mark on the stretch scale. Therefore, the instrument has satisfactory scales.

During the actual testing of paper specimens, it was noted that the pointer of the instrument jumped in the direction of higher readings just as the specimens broke. The jump was greater for specimens of high tensile strength than for those of low strength.



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It was not due to a sudden increase in the rate of elongation of the specimen, but to the fact that the stretch mechanism was dynamically unbalanced to such a degree that the shock experienced when the specimen broke accelerated the mechanism so as to move the pointer to higher readings. When the shock experienced during testing was simulated by pounding the base of the instrument by hand with a severity which seemed to cause the instrument to vibrate about as much as it did in use, the pointer also moved up the scale. The shock experienced by the instrument, when the specimen breaks or when the base is pounded, is principally vertical, and the downward impulse imparted to the rod, slider, and rack of the stretch mechanism is transmitted to the quadrant gear as an impulsive torque greater than the counter torque due to the relatively light pointer; therefore, the net torque is such as to move the pointer to higher readings. The dynamic balance of the mechanism was improved by fastening one end of a light piano wire to the slider and carrying it up to and over a pulley fastened to the frame of the instrument above the slider and fastening a weight to the other end of the wire. The size of the weight was adjusted until the pointer showed no tendency to jump when specimens broke during the test. This method of improving the dynamic balance was merely a temporary expedient and was not a desirable one because a given weight was not satisfactory for all specimens. A part of the shock experienced by the instrument is due to that imparted by the pendulum as the pawls catch on the teeth of the tensile scale quadrant when the specimen fails. The vertical component of the impulse given the instrument depends upon the weight fastened to the pendulum and upon the angular position of the pendulum. If the heavy weight is on the pendulum and the tensile strength of the specimen is great, so that the pendulum is well out along the quadrant, the vertical component of the impulse is relatively great, compared with that when the light weight is on the pendulum and the specimen is weak, so that the pendulum is displaced only slightly along the scale when the specimen breaks. A rather serious change in the design of the instrument is necessary in order to correct this fault properly. The magnitude of the error is indicated by the data for a kraft folder having a basis weight of 136 pounds (25×40—500), a caliper of 0.0109 inch, and a tensile strength of 25.5 pounds. When tested in the cross-machine direction, the indicated percentage stretch was 5.47% without the counterweight and 5.19% with the counterweight.

The Scott Serigraph, Model J3

The charts for the load-elongation recorder of this particular instrument have elongation scales covering a range of 4 inches. The half-inch divisions are marked and are subdivided to permit direct reading to 0.1 inch. The subdivisions are sufficiently large to allow estimations to as little as 0.02 inch. This sensitivity is not adequate for some purposes in paper testing, because it allows reading the percentage stretch of a 6-inch specimen to only 0.3 units. However, this particular instrument was not intended primarily for paper testing. The sensitivity can be increased by changing the gears which drive the chart table. The manufacturer supplies these instruments with other chart speeds, and, therefore, with other sensitivities.

The elongation scale was checked by the rubber band technique, and the changes in clamp separation measured with calipers and rule agreed with the indicated elongations within the accuracy with which the scale could be read at elongations of 1, 2, 3, and 4 inches.

The accuracy with which these large divisions were subdivided was checked with dividers, and the uniformity was adequate. The curves obtained were sometimes irregular, apparently because of the erratic motion of the pendulum caused by the friction in the pendulum bearings, the pawls, and pen carriage, which was discussed in Report 29, Part II *(9)*. The accuracy of the elongation indication was not directly affected by this friction or the nonuniform motion of the pendulum which it caused. However, a nonuniform motion of the pendulum is definitely undesirable, as it has the effect of applying load jerkily to the specimen and, hence, may produce an elongation different from that produced under conditions of smooth loading.

Clark Stretch Tester

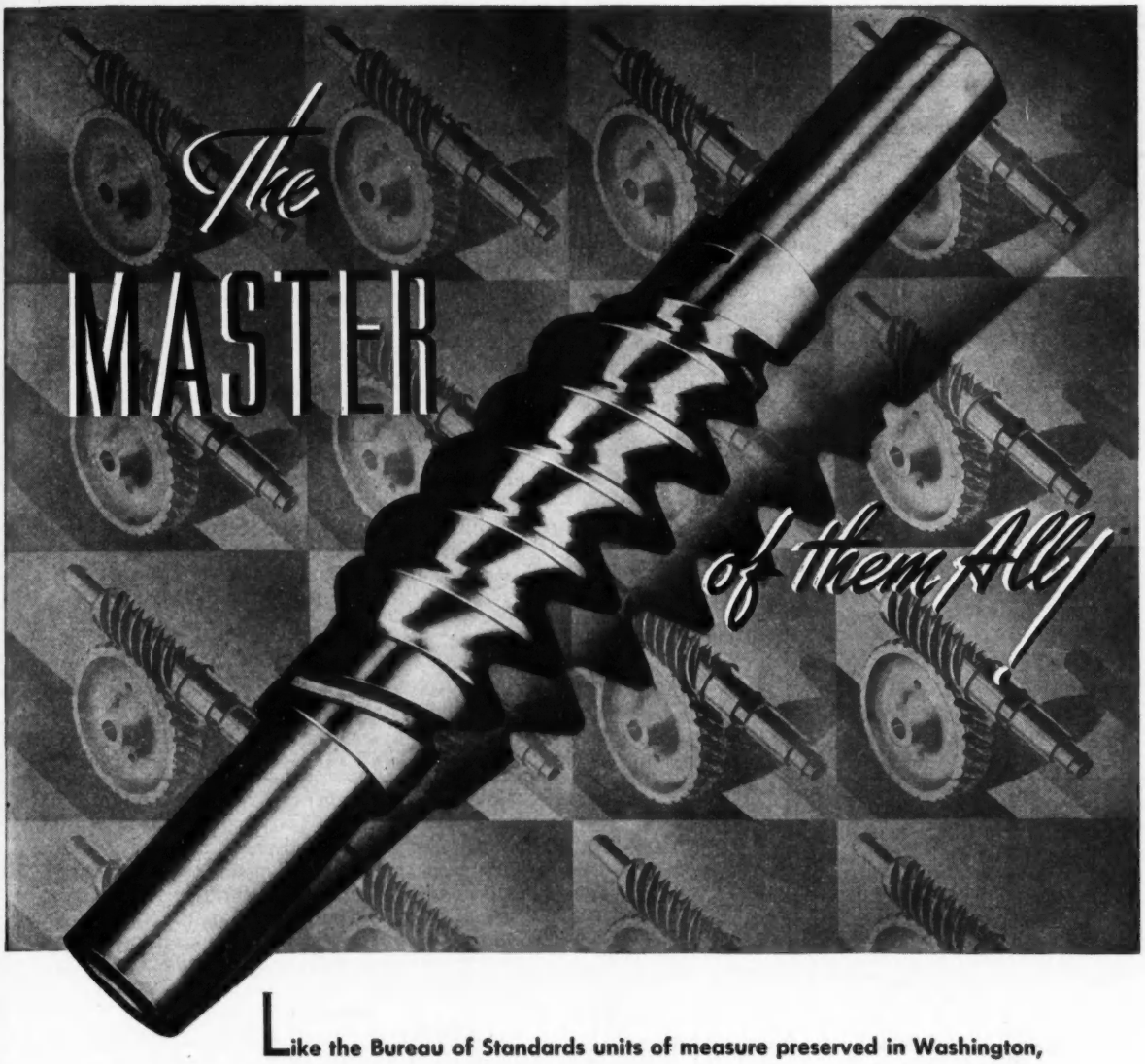
The scale of this instrument was found to be accurately divided. The distance from the zero to the 1.5-inch division was correct to the accuracy with which a good steel rule could be read. The subdivisions were uniform. The total length of the five vernier divisions equalled the length of four scale divisions, as indicated by superposition, and the vernier divisions were identical in length according to test with dividers.

As was stated in the earlier description of this instrument, the least displacement of the plunger which can be measured is 0.01 inch. From the formula given, this increment in displacement corresponds to a change in percentage stretch for a 4-inch specimen of 0.05 unit in the neighborhood of 0.5% stretch and of 0.19 unit in the neighborhood of 8% stretch. This sensitivity is satisfactory. The vernier registered zero just as the plunger touched the specimen.

Agreement Between Stretch Testers

After this calibration of the scales of the various instruments and the finding that their accuracy is sufficient to render observed percentage stretches reliable to 0.1 unit if specimen variations are sufficiently small, it might be expected that tests on the several instruments of carefully sampled specimens should yield results agreeing to nearly 0.1 unit. However, that optimistic expectation was not justified.

Specimens of six papers were tested on two or more of the four instruments. The papers were conditioned for at least 12 hours and were tested in an atmosphere of 65% relative humidity and at a temperature of 70° F. In each case, the required number of specimens were cut consecutively from the paper and kept in the order of cutting. They were then dealt into the required number of groups. All specimens were 15 mm. wide. The tested lengths were the same for each instrument involved in a particular comparison but varied from 180 mm. to 4 inches in different comparisons. The instruments were operated at speeds which made the loading time the same for each instrument involved in a comparison. The crank operation of the Clark instrument did not lend itself well to such controlled timing and, therefore, the crank was temporarily removed and replaced by an 18-inch arm of wood which was connected by a wire to the lower clamp of the Schopper instrument, whose speed was adjusted to make the loading time of the Clark instrument assume the desired value. The Schopper stretch mechanism was



Like the Bureau of Standards units of measure preserved in Washington, a set of exact MASTER worms is preserved in the De Laval shops as a reference standard to assure unvarying uniformity in the production of worms and gears. For instance, without this MASTER WORM, in conjunction with special gauging devices, it would be difficult, if not impossible, to maintain the uniformity of thread thickness, preciseness of tooth contour and perfect inter-changeability of parts, strictly adhered to at De Laval.

Other manufacturers may make worm gears, but not all employ the precision methods responsible for the superior performance and long life of De Laval products. *Specifications alone do not make a worm gear.*

M-51

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counterbalanced. The usual procedure was adopted of discarding test results when the specimen failed at the clamp; no watermarked or disfigured specimens were used. Table III lists the results of the comparison and describes the papers used. The numbers in parentheses are the probable errors in the listed mean values.

The values observed with the Amthor and Schopper instruments agree fairly well; in 2 out of 24 cases, the differences are as great as 0.3 unit. When differences occur, the Schopper values are more often lower than higher. Except for one case, the Scott values are lower than those for the Amthor and Schopper instruments. In 14 comparisons, the Scott values were within 0.2 unit of either the Amthor or Schopper values only four times. In one case the difference was 0.8 unit, in two cases the difference was 0.6 unit, in one case it was 0.5 unit, in three cases it was 0.4 unit, and in three cases 0.3 unit. The Clark tester was not compared with the Scott instrument as they were not available simultaneously. However, in 10 comparisons with the Amthor and Schopper instruments, the values obtained with the Clark tester were lower by 0.6 unit in two cases, and by 0.3 unit in one case. The probable errors listed in Table III indicate that the large discrepancies are not due to sample variations.

(To be concluded)

Safety Rules for Truck Operators

As a contribution to the present drive for reduction of accidents in industrial plants, the Elwell-Parker Electric Company, Cleveland, Ohio, has formulated a set of safety rules for operators of power industrial trucks. These rules are intended to supplement the basic instruction of the operator and to interpret the general precaution to "Drive Carefully." It is pointed out that in most cases it would be advisable to modify them by specific reference to local conditions, such as observance of one-way routes, hints for checking loads before pick-up, etc.

1—Move control levers firmly from one speed to another and without hesitation. This is to prevent arcing, which pits the contact surfaces of the switch. If you allow these contacts to become damaged you may fail to get the expected response from your control lever at a time when you want it very much.

2—Keep your load as low as possible when moving. There is no danger of tipping a load carried at a low level. Keep it low enough so that you can see over it.

3—Keep your truck behind the load. If you should get off suddenly, or fall off, then the load will be moving away from you and it can do you no harm. When going up steep inclines it is sometimes better to reverse this position and have the truck pull the load.

4—Avoid making quick or jerky stops. The momentum of the load may play tricks on you. Be especially careful about stops when you have a load elevated for tiering or stacking.

5—If your truck has a tilting device—use it. By tilting the upright toward you the weight of the load is brought back slightly and the balance is improved. This slight tilt of 10 to 15 degrees will avoid spilling the load when rounding corners.

6—Go easy when approaching danger points. These are: elevator gates, pits, bridges, inclines, tunnels and tracks. Get the habit of crossing tracks diagonally instead of at right angles.

7—Take a good look at your load before you pick it up. If you have to move a doubtful load, slow down.

8—Be sure to pick up every load squarely. Then there is no danger of the load shifting, due to offside loading, while you are in motion. When small boxes in pallet or skid lots are raised above the uprights, be sure that those on the back corners have not shifted to fall on you. Insist on wide load back rests.

9—Report rubbish on floors to your foreman. You and your truck are safer on clean runways.

10—Don't cut corners. You are in danger of having to stop quickly—lose the load—hurt someone or damage the goods.

11—Keep your truck clean. Dirt and rubbish make your footing uncertain and may cause trouble if obstructions lodge somewhere in the mechanism.

12—Don't carry passengers. You need all the room you have, for perfect control of your truck.

13—Don't allow others to operate your truck. They may injure someone, or damage the truck or tires. It takes time to get spare parts these days.

14—Report need for repairs immediately. Repairs take the least time when they are made promptly.

Rules on Extra Light Newsprint

WASHINGTON, D. C., June 28, 1944—Extra light newsprint paper may be sold by manufacturers at a higher price than the ceilings applicable to standard or light weight newsprint, the Office of Price Administration announced today.

Standard newsprint generally is 32 pounds for 500 sheets 24 by 36 inches in size. Lightweight newsprint, which manufacturers already are permitted to sell at $4.00 per ton above the ceilings for standard newsprint, generally is 30 pounds for the same number and size of sheets. Today's action applies to newsprint made in a weight less than 30 pounds for the same number and size of sheets, and is effective July 1, 1944.

Chlorine Exemption Raised

WASHINGTON, D. C., June 28, 1944—The War Production Board today amended Order M-19, governing the allocation of chlorine, to raise the small order exemption and to remove the end use certification formerly required for small orders falling within that category.

All cylinders of less than 2,000 pound capacity are now permitted in small order exemptions, regardless of total weight in any one period, according to the provisions of today's amendment. Formerly, the small order exemption for any producer or distributor was limited to a total weight of 2,000 pounds of chlorine or less for any one month.

Ft. Orange Paper Co. Elects Officers

CASTLETON, N. Y. June 24, 1944—The annual meeting of stockholders of the Fort Orange Paper Company, was held here this week at which directors for the year were chosen. Among the directors elected were W. Gordon Latham, Robert S. Harris, Arthur C. Schroeder, Richard E. Dwight and Robert C. Poskaner. Ten thousand votes were cast for each director. The inspectors of election were Thurston T. Paul and Janette Paul.

Stevens-Nelson Corp. to be Agent

The Stevens-Nelson Paper Corporation, 109 East 31st street, New York 16, N. Y., with branch office at 453 Washington street, Boston 11, Mass., has been appointed as of July 1, 1944, sole agent for the marketing of Troya and Manaya tissue, technical and specialty papers, produced by the John A. Manning Paper Company, Inc., Troy, N. Y. The Stevens-Nelson Paper Corporation has representatives in ten other cities covering the major marketing areas across the United States from coast to coast.

These Oriental-type papers as developed and produced by the John A. Manning Paper Company, Inc., in recent years are now in general use, and besides supplying the demands for papers formerly imported from Japan, are finding many uses in the trade. These American-made Troya and Manaya papers are available for applications of a technical nature and their uses for some purposes require saturating or treatments applied in which regard the Stevens-Nelson Paper Corporation is prepared to be of assistance.

R. R. Woodhead, who for nearly ten years was sales manager in charge of the paper division of the John A. Manning Paper Company, Inc., became associated with the Stevens-Nelson Paper Corporation July 1, 1944. His valuable experience and intimate knowledge of these Manning papers are available in a technical capacity where problems of this nature arise.

The John A. Manning Paper Company, Inc., during this war period is producing these Troya and Manaya papers at full capacity and right now, of course, precedence is given to papers that are most useful in the war effort. However, where the possible uses at this time may not be in direct relation to the war effort, the Stevens-Nelson Paper Corporation welcomes inquiries and can in many instances provide a satisfactory paper.

It is not too early for consideration of postwar production and marketing, and the Stevens-Nelson Paper Corporation is prepared to study such problems.

Date Extended for Fiber Containers

The War Production Board today extended the date on which orders may be placed for fiber shipping containers, carrying AA-1 priority, for delivery directly to the Navy, from July 1 to October 1, 1944. Orders for this type container must be filled prior to November 1, 1944, instead of August 1, as previously required, according to an amendment to Direction 1 to the fiber container Preference Rating Order P-146, issued on June 30, 1944.

Fiber shipping containers so ordered may be used for packaging certain clothing, hats, gloves and other outerwear and undergarments, footwear and bedding, for the U. S. Navy only, WPB officials explained.

Michigan Div.'s Annual Golf Outing

The Michigan Division of the American Pulp and Paper Mill Superintendents Association will have its annual summer golf outing on Friday, August 4, at the Kalamazoo Country Club.

The golf committee, headed by Al Sherwood of the Sutherland Paper Company, has arranged for a full afternoon of golf beginning at 1:30 P. M., with miscellaneous golf prizes to be awarded at dinner which will be served at 6:30 P. M. in the clubhouse.

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Equip Your Present Trucks with Ready-Power Gasoline Electric Power Units.
Designed for continuous operation. Increases material handling ability. Reduces ton-mile cost. Full use of your present trucks with Ready-Power will relieve your man-power shortage. Many Ready-Power Units now operating throughout the paper and allied industries.
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FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending July 1, 1944

STOCKS

	High	Low	Last
A. P. W.	4	3⅝	3⅝
Armstrong Cork Co.	46⅝	44½	44½
Celotex Corp.	15½	14⅝	15
Celotex Corp., pf.	18¾	18¼	18¾
Certain-Teed Products Corp.	9	7⅜	8¼
Certain-Teed Products Corp., pf.	87	78¾	86¾
Champion Paper & Fibre Co.	28½	26¾	28½
Champion Paper & Fibre Co., pf.	113	112	112½
Congoleum Nairn Co.	26⅝	26	26⅜
Container Corp. of America	25¾	25¼	25¾
Continental-Diamond Fibre Co.	12½	11⅝	12½
Crown-Zellerbach Co.	18⅜	17⅞	17⅞
Crown-Zellerbach Co., pf.	100¾	100	100½
Dixie Cup Co.	17⅞	17¼	17½
Dixie Cup Co.—A	46½	45¾	45⅝
Flintkote Co.	26	25⅜	25⅜
Flintkote Co., pf.	107	106	107
Robert Gair	4¾	4½	4⅝
Robert Gair, pf.	15½	14¾	15½
International Paper Co.	19¾	18¾	18⅞
International Paper Co., pf.	84⅛	83⅜	84
Johns-Manville Corp.	99	96¾	97⅛
Johns-Manville Corp., pf.	....	....	....
Kimberly-Clark Corp.	38⅛	38½	38½
MacAndrews & Forbes	29	28¾	28¾
MacAndrews & Forbes, pf.	....	....	....
Masonite Corp.	49	47	47⅛
Mead Corp.	11¾	10⅞	11⅛
Mead Corp., pf. A-6%	93	93	93
Mead Corp., pf., B-5½%	85	82	85
National Container Corp.	17⅞	16⅞	17⅞
Paraffine Companies, Inc.	58	58	58
Paraffine Companies, Inc., pf.	106	105½	106
Rayonier, Inc.	16⅜	16⅛	16⅜
Rayonier, Inc., pf.	32½	32¼	32½
Ruberoid Co.	31⅛	30¾	31⅛
Scott Paper Co.	41¾	41¾	41¾
Scott Paper Co., pf.	110¾	110¼	110¾
Sutherland Paper Co.	....	....	....
Union Bag & Paper Corp.	13	12¼	12¾
United Paperboard Co.	6¾	5⅝	6⅝
U. S. Gypsum Co.	88	85	85
U. S. Gypsum Co., pf.	174½	174	174¼
West Virginia Pulp & Paper Co.	26½	25⅜	25½
West Virginia Pulp & Paper Co., pf.	....	....	....

BONDS

Abitibi Pulp & Paper Co. 5s '53	80	78	80
Celotex Corp. 3¾s '55	103¼	103¼	103¼
Certain-Teed Products Corp. 5½s '48	102	101	102
Champion Paper & Fibre Co. 4¾s '50	....	....	....
International Paper Co. 6s '55	108¼	108	108
International Paper Co. 5s '47	104½	104⅛	104⅛
Mead Corp. 3½s '53	....	....	....
West Virginia Pulp & Paper Co. 3s '54	....	....	....

New York Curb Exchange

High, Low and Last for Week Ending July 1, 1944

STOCKS

	High	Low	Last
Great Northern Paper Co.	35½	34¾	35½
Hummel-Ross Fibre Corp.	7⅛	6	6⅜
St. Regis Paper Co.	6	5¼	5⅜
St. Regis Paper Co., pf.	165	163½	165
Taggart Corp.	6	6	6

BONDS

American Writing Paper Co. 6s '61	....	....	....

Rayonier Profits Off

Rayonier, Inc.—Year to April 30 reports a consolidated net profit of $1,688,709, equal, after preferred dividends, to 45 cents each on 963,871 common shares, against $1,877,459, or 65 cents a common share, the year before; sales, $22,823,538, against $28,427,865. Edward Bartsch, president, said shortages in log supplies and manpower in Pacific Northwest resulted in diminished profits.

American Box Board Nets 93 Cents

The American Box Board Company for the twenty-four weeks to May 14, reports a net income of $112,818, equal to 93 cents a share, against $87,159 or 72 cents a share for last year's period; net sales, $2,888,730 against $2,114,620.

Brown Company Profits Up

Brown Company, Berlin, New Hampshire, and its Canadian subsidiary, Brown Corporation, manufacturers of pulps, paper, towels, conduit, and other products, report unaudited consolidated net income of $778,792 after taxes and all other charges, for the 28 weeks ended June 10, 1944, as compared with $674,730 for the corresponding period of last year. For the same period, net income before taxes in 1944 was $1,478,792 as against $1,593,230 in 1943 and income taxes for the respective periods were $700,000 and $918,500.

In conformity with rulings of the tax authorities, depreciation charges for this year to date were $653,079 as compared with $983,321 for the corresponding period of last year. As a result of the reduction in depreciation, the net income for this year is slightly more favorable than for the corresponding period of 1943. Working capital has increased by $576,129 to $13,745,610 in the current fiscal year, and continued progress is being made toward the effectuation of the Company's post-war plans.

Infringement of Hydrapulper Charged

Suit was filed in the United States District Court for the Southern District of New York on June 29, 1944 against the San-Nap-Pak Manufacturing Company of 1440 Broadway, New York, by the Cowles Company of Cayuga, N. Y. and the Black-Clawson Co. of Hamilton, Ohio, sole licensees under the Cowles patent, charging infringement of U. S. Patent No. 2,351,492.

It is claimed that San-Nap-Pak Manufacturing Company designed, built, and installed at its Wilmington, Del. plant a pulper in direct violation of claims contained in the above patent. The hydrapulper has proven revolutionary in the method of reducing pulp and paper to slush form and the co-plaintiffs advise that full patent protection is to be sought and maintained.

H. P. Smith Goes With Mathieson

H. P. Smith, formerly president of the George Chemical Company, and Thomas Tarpy Schulten, formerly with the General Chemical Company, have been appointed field representatives of the New York office of the Mathieson Alkali Works.

Mr. Smith has had wide experience in handling and distributing alkalies and other chemicals and is well known to users of these materials in the New York metropolitan area. He is a graduate of Columbia University.

Mr. Schulten is an alumnus of St. Mary's College, Kansas, and the University of Virginia, and pursued special studies at the Brooklyn Polytechnic Institute. He was with the General Chemical Company for eight years.

Beveridge Plant to Hold Election

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., June 30, 1944—The national labor relations board has ordered an election held among employees of the Beveridge Paper Company of Indianapolis to determine if they wished to be represented by Indianapolis Paper Products Specialty Union 509, affiliated with the International Printing Pressmen and Assistants' Union.

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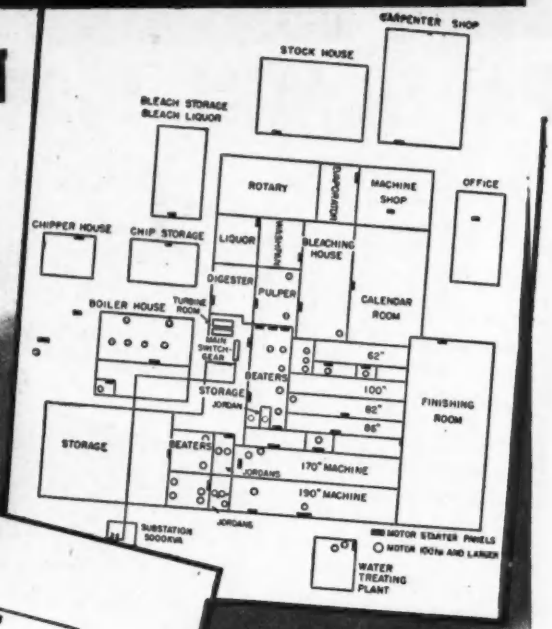
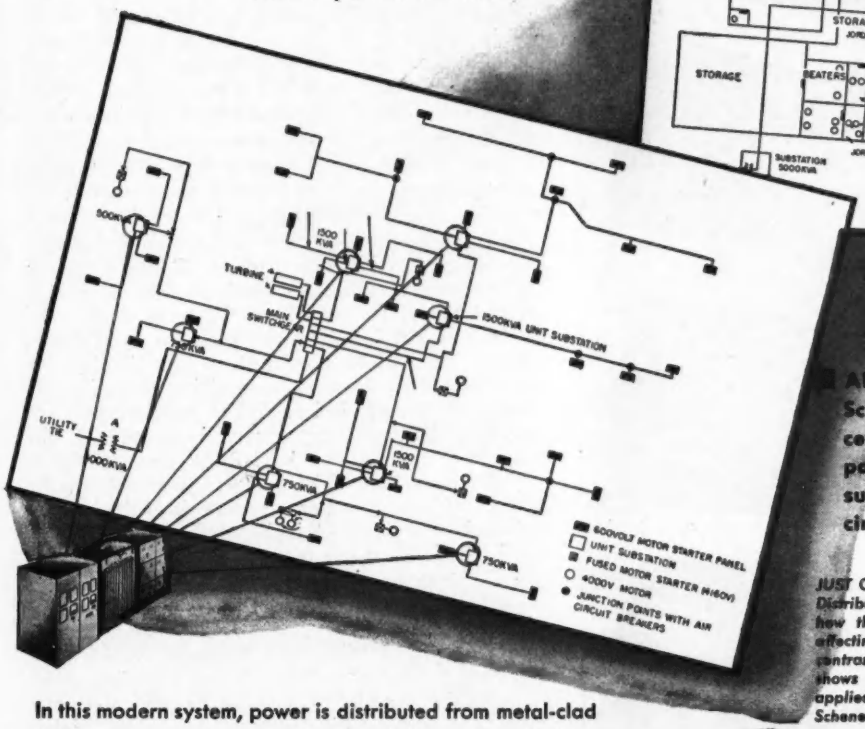
FIT A LOAD-CENTER PLAN TO YOUR MILL

TO MEET THESE POWER NEEDS ➡ **Typical medium-sized paper mill showing location of all motors 100 horsepower and over. Also starter panels for all motors.**





ADOPT A PLAN LIKE THIS **Schematic diagram of the load-center distribution system of paper mill shown above. Unit substations are in the colored circles. (4160 volts primary)**

***JUST OFF THE PRESS:** "Power Generation and Distribution for Modern Paper Mills." It tells how the trend to higher steam pressures is affecting electric power-generation equipment, contrasts various power-distribution systems, shows how load-center distribution is best applied. Ask for GEA-4275. General Electric, Schenectady 5, N. Y.*

In this modern system, power is distributed from metal-clad switchgear or master unit substation (A) at relatively high voltage (2.4 to 13.2 kv) to load-center unit substations located near the centers of electrical-load areas. There it is stepped down to utilization voltage (below 600 volts) and distributed to the load through drawout air circuit breakers and short secondary feeders.

Buy all the BONDS you can—and *keep all you buy*

GENERAL ELECTRIC

LOAD-CENTER POWER DISTRIBUTION SYSTEMS

4 GRADES SONOCO PAPER MILL CORES

RHINO NON-RETURNABLE

For all uses requiring an extremely tough non-returnable paper mill core.

DURO*—Standard returnable core of plus-standard quality. Shown with Taylor ends. Also available with Bermico ends.

ENDURO*—Very high grade returnable core to meet extra demand for strength. Shown with Bermico ends. Taylor ends available.

*Supply limited, due to shortage of higher grade stock from which these cores are made.

BERMICO†—A returnable fibre core—extremely hard, strong and rugged. Treated to resist weather and moisture changes.

†Exclusive distributors for Bermico ends, Bermico Fibre Cores.

ARMY-NAVY "E"

A CRITICAL NEED SAVE WASTE PAPER

SONOCO MAKES *EVERYTHING* IN *PAPER CARRIERS*

SONOCO PRODUCTS COMPANY

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Ceiling on Mimeograph Paper Higher

Acting in cooperation with the War Production Board to conserve vital supplies of fiber, the Office of Price Administration has increased by 7½% ceiling prices at the manufacturing level for the only weight of chemical wood pulp mimeograph paper that may now be produced for civilian use. The increase becomes effective June 21, 1944.

Sales of this paper at the retail level are negligible, but no increase in prices will result for any retail sales made, as retailers are "frozen" to their March 1942 highest prices, according to OPA.

The principal ultimate consumers of this paper are printers and industrial consumers, who, in some cases, buy from manufacturers, but mainly purchase from merchants. The merchants will pass on the 7½% increase, along with their own percentage markups. OPA pointed out, however, that, on most sales, buyers will actually obtain the same number of sheets for less money than they have been paying previously for heavier sheets.

The War Production Board, in a move to conserve vital fibre supplies, on June 5 ordered that production of mimeograph paper be confined to the 16-pound weight class when for civilian use, which means 16 pounds for 500 sheets measuring 17 by 22 inches.

Because it is more expensive to produce light sheets, the WPB action has necessitated the increase in manufacturers' ceilings to compensate in part for the added cost of confining production for civilian use to the lightest standard weight, OPA said.

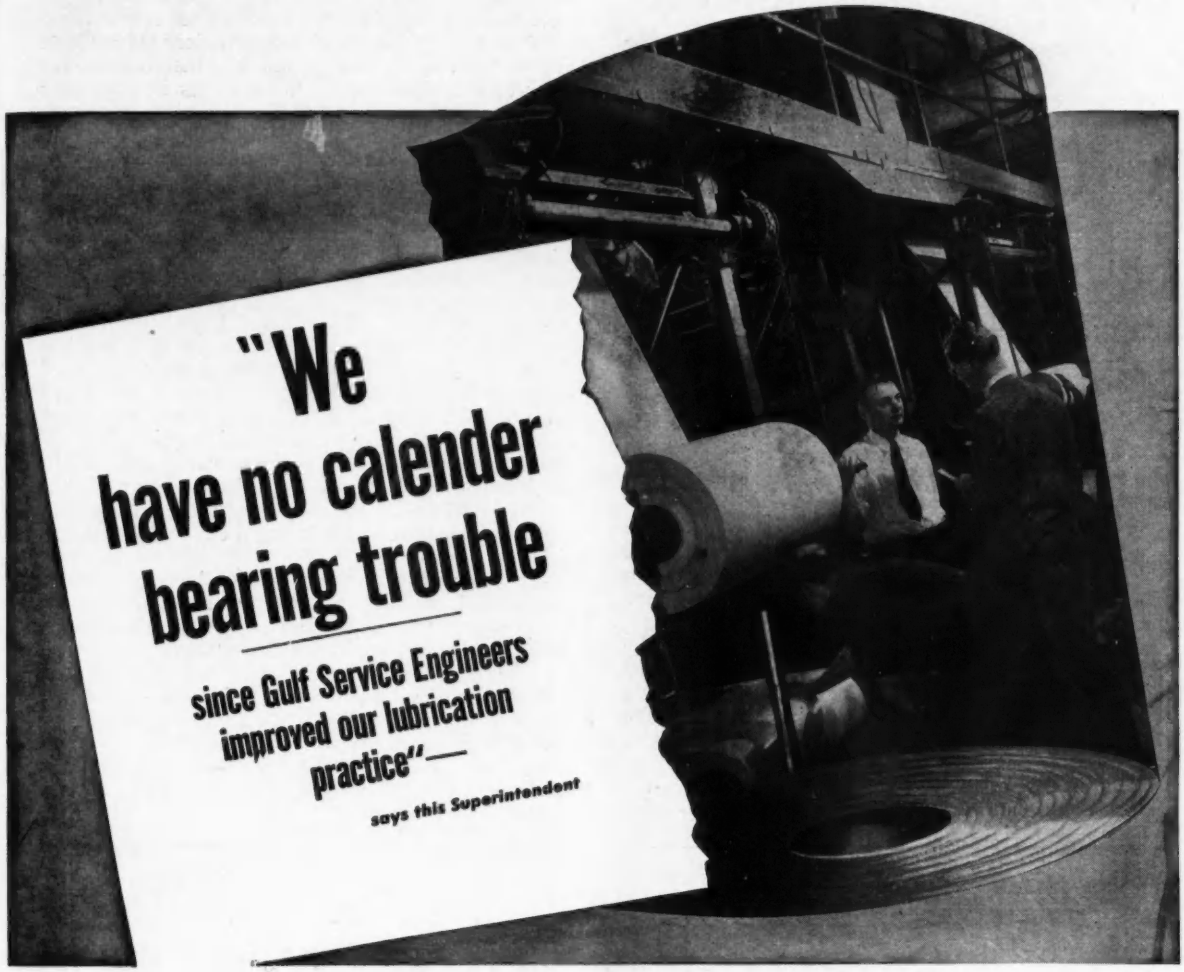
For example, the new zone 1 ceiling price of manufacturers (ceilings are established by four geographical zones) for #1 Mimeo Watermarked in the 16-pound weight is $1.55 per ream of 500 sheets, compared with $1.44 previously. For the heavier weights of paper, however, comprising three-fourths of the total volume before WPB restrictions were ordered, which no longer may be produced for civilian use, the ceilings have been from $1.62 to over $2.00 per ream. These buyers now will only be able to get 16 pound paper, when stock of the heavier weights already produced is disposed of, and the ceiling for that is $1.55 per ream.

Zone 1 includes the following States and cities: Connecticut, Delaware, District of Columbia, Illinois, Indiana, Iowa, Kentucky, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, Tennessee, Vermont, Virginia, West Virginia, Wisconsin, Omaha, Nebr., and Sioux Falls, S. D.

Tighten Control of Manila Rope

Use of waste manila rope in paper manufacture is limited to papers listed in Conservation Order M-294, according to an amendment to the order issued by the War Production Board today. When waste manila rope is reused as rope, it is now subject to the provisions of Order M-84, it was stated by officials of the Pulp Allocation Office of WPB.

This action became necessary because of apparent lack of control over the reuse of manila rope, officials said, and a large quantity of waste manila rope has been used in the manufacture of ships' fenders, bumpers and cargo nets. The great demand for the highly essential papers has necessitated closer control of this critical material.



Actual photo of a Gulf Service Engineer (right) consulting with calender department Superintendent on the lubrication of calender bearings.

"By following Gulf Engineering recommendations, we keep tonnage up and maintenance costs down"

"Several years ago we had a great deal of trouble with our calender bearings, which we attributed to the high pressures necessary to calender our glassine paper," says this Superintendent. "But Gulf Service Engineers licked this problem by improving our lubrication practice, and since then we haven't lost a bearing. Better lubrication has also led to lower maintenance costs and a general improvement in mill operation."

This mill, like many others, has found that it pays to call in a Gulf Service Engineer and keep him "in the picture." A specialist in scientific lubrication, he knows how to cut wear and keep machines up to maximum production by the proper application of the right lubricant for every moving part.

Call in a Gulf Service Engineer today and let his knowledge and experience go to work on your lubrication and maintenance problems. His practical recommendations and suggestions are bound to result in some improvement in mill operating efficiency. Write, wire, or phone your nearest Gulf office.

Gulf Oil Corporation • Gulf Refining Company • Gulf Building, Pittsburgh 30, Pa.

GULF INDUSTRIAL LUBRICATION

BACK THE ATTACK...BUY MORE WAR BONDS!

Warns Mills To Meet Military Needs

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., July 5, 1944—Demands of the military forces for printing, map, mimeograph, waterproof and business papers, as well as certain specialty paper, must be met by U. S. mills or the mills will be forced by directives to supply these essential requirements, the War Production Board Paper Division told members of the Over-All Paper Advisory Committee, which met in Washington this week.

Representatives of the Army reported great difficulty in securing delivery of certain types of paper recently, and appealed to the representatives of the paper industry for closer cooperation, pointing out the essentiality of paper in the operations and movements of our armies as they penetrated farther toward their objectives. Indications were that heavier demands would be placed on the paper manufacturers for supplies necessary to the armed forces in the third quarter. While some mills have extended themselves, others have failed to give full cooperation, the Army representatives said.

Officials of WPB called attention to the fact that the Second War Powers Act gives to WPB sufficient power to direct individual mills to produce specified papers for army orders. It was admitted, however, that the use of directives is not always desired by the Army, provided paper manufacturers endeavor to fill all military orders before they undertake to meet less essential requirements. It was made clear that the Paper Division would enforce regulations to the end that the army gets the paper it needs.

Military requirements are not unduly exacting, WPB said. It was pointed out that when paper mills are unable to meet specific Federal specifications, the specifications are sometimes waived when it is brought to the attention of the procurement officer that current pulp conditions do not permit the manufacture of paper to the exact specifications. This is done only when the quality offered will suit the end use required. Savings in virgin pulp amounting to between 12 and 15 per cent have been effected in some instances, WPB said, where mills increased the use of waste paper and other substitute materials and yet produced usable paper.

The outlook for the third quarter is extremely difficult to predict, Governmental officials indicated. Despite some increases in pulpwood production, it was pointed out, industry will have difficulty in meeting third-quarter paper and paperboard requirements. It was predicted that the paper and paperboard mills would find the third-quarter pulp allocations tighter than at any time since pulp allocation began. No extra pulp above normal allocation will be authorized for the production of direct war orders, WPB said, indicating that mills will have to stretch the pulp received as far as possible by use of waste fibre and substitute fibre in producing the required amounts of paper.

The essentiality of functional or business papers, was pointed out by a member of the industry, who said that business forms and papers were extremely essential to industry and the Government, and necessary if general business is to continue to function.

Reviewing the present situation and the outlook for the third quarter, officials said that military and non-military paper requirements, together with packaging demands for both the military and domestic food uses, would be higher than for any previous quarter.

FOR *Better* RESULTS TRY WITCO'S NO. 11

WITCO CARBON BLACK NO. 11 is a dustless, cleaner carbon black that disperses readily and evenly to impart a deep, rich tone to your black papers. It is more economical . . . gives finer, more uniform results and may be placed directly in the beater without removal from the bag. Avail yourself of this opportunity to improve and reduce the cost of your black papers. Write for samples today.

WITCO CHEMICAL COMPANY

MANUFACTURERS AND EXPORTERS

[Formerly Wishnick-Tumpeer, Inc.]

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Tag Industry Meets To Discuss Supplies

Members of the newly appointed Tag Lndustry Advisory Committee and War Production Board officials have met to discuss the supply of materials and shipping containers as it affects the industry, WPB reported last week. Members of the committee are:

W. C. Bailey, Jr., The Reyburn Manufacturing Company, Inc., Philadelphia, Pa.; Carl A. Bischoff, Tag Division, Cupples-Hess Corporation, St. Louis, Mo.; Ira N. Foss, National Tag and Label Company, Cambridge, Mass.; R. A. Maish, Dennison Manufacturing Company, Framingham, Mass.; C. H. Padmore, The Denney Tag Company, Westchester, Pa.; A. H. Swett, Jr., American Tag Company, Belleville, N. J.; R. W. Peddicord, Monarch Marking System Company, Dayton, Ohio; George E. Phelph, Allen-Bailey Tag Company, Inc., New York, N. Y.; Paul M. Pope, A. Kimball Company, New York, N. Y.; Lloyd R. Price, Robinson Tag and Label Company, New York, N. Y.; A. G. Shennan, International Tag and Salesbook Company, Chicago, Ill.; Floyd Wrightsman, Haywood Tag Company, Lafayette, Ind.

H. L. Clary, Consumers Durable Goods Division, WPB, has been appointed Government presiding officer.

Committee members stressed the need for copper wire to attach tags to cotton bales. A non-corrosive wire such as copper wire is best suited, they said, since tags sometimes remain on bales for as long as a year. The WPB representatives advised that at the present time no copper wire is available for this purpose and the supply of such material is still critical. Members reported that the industry has suffered no hardship by the substitution of galvanized wire for prohibited tin coated tag wire.

Polished zinc has proved to be a satisfactory substitute for nickel in the manufacture of tag rims, industry members said.

WPB representatives said that the use of wood pulp has been curtailed, and it is not expected that increased quantities for the manufacture of sulphite and suphate papers used by the industry will be available in the foreseeable future.

Since the industry has no preference rating under M-317, committee members said they were experiencing difficulty in obtaining certain types of cloth for essential types of tags. WPB representatives said that manufacturers could apply for priority assistance by submitting Form WPB 2842 in quadruplicate to the Textile, Clothing and Leather Bureau, WPB, Washington, D. C. It was pointed out that favorable consideration could be given only to applications for priority assistance in obtaining seconds and shorts.

Allotment to the tag industry under L-317 of shipping containers at the rate of 50 per cent of 1943 usage is insufficient to meet essential requirements and is causing hardship to the industry, committee members said. They recommended that, since at least 90 per cent of the tags made by the industry are used for purposes essential to the war effort, the shipping container quota for tags, pin tickets, and pin-on tickets be increased to at least 70 per cent of 1943 usage. WPB representatives suggested that industry members who are suffering excessive hardship under L-317 file appeals under that order. The industry is now coping with the shortage of containers by re-using containers and by packing more tags in one carton.

WAR materials roll faster from our shops because of many new, modern machine tools. Assembly lines are helping to speed-up output. The accelerated war production program called upon us to do more and more and more. Plant expansion and additional machines were required. While installed primarily to increase the supply of equipment for our fighting forces, most of the changes we have made fit into our normal, peacetime operating needs. Today's production for Victory speaks well for tomorrow's production for peace. We hope that our employees now on the battle fronts will soon be back. We hope that before very long these machines will not be used to build for war but can serve the nation by making paper mill machinery needed to supply a world at peace with the wide variety of paper products necessary to better living.
THE APPLETON MACHINE COMPANY
APPLETON
WISCONSIN

American Pioneers

The first passenger train operating on a regular commercial schedule in America was the "De Witt Clinton," which made its initial trip in 1831, on the Mohawk & Hudson Railroad between Albany and Schenectady.

The first railroad in New England was built in 1826 in Norfolk County, Massachusetts, in the town of Quincy. Only two miles long, it was operated by horses, to bring granite from the local quarries for building the monument at Bunker Hill.

Canton, Massachusetts, in the same county, pioneered in the manufacture of paper makers' felts at DRAPER BROTHERS COMPANY, established 1856. The same spirit which inspired pioneers, keeps them ever alert to adopt new methods to improve the making of **DRAPER FELTS.**

Draper Felts For Efficiency

DRAPER BROTHERS COMPANY

Woolen Manufacturers Since 1856

CANTON, MASS.

OUR REPRESENTATIVES to serve you

L. H. BREYFOGLE, Kalamazoo, Mich.

RALPH E. BRIGGS, Canton, Mass.

W. L. CAMPBELL, Savannah, Ga.

E. R. LELOFF, Vancouver, Wash.

CHAS. E. BERTSCHY, Milwaukee, Wis.

Chemical Task Committee

President Raymond L. Barton has approved of the representatives of Superintendents and of Industrial Affiliates selected by Past President Stanford Blankinship and Norman O. Weil, chairman of the Industrial Affiliates Committee, to serve as members of the Chemical Group Task Committee of the American Pulp and Paper Mill Superintendents Association.

Mr. Barton will be Chairman of this Committee and Mr. Weil will be co-chairman. The members of the Advisory Committee to the Chemical Group Task Committee and the members are as follows:

Raymond L. Barton, Michigan Paper Company, Chairman.

Norman O. Weil, W. S. Tyler Company, Co-Chairman.

George W. Craigie, John Cornell, Co-Secretaries.

Superintendents Association: Henry P. Baldwin, Consolidated Water Power and Paper Company; Arnold J. Barea, Paterson Parchment Paper Company; Thomas M. Barry, Fraser Paper, Ltd.; Raymond F. Bennett, Ecusta Paper Corporation; C. G. Frampton, Fernstrom Paper Mills, Inc.; Walter F. Hoffman, Fitchburg Paper Company; Ronald W. Haynes, Newton Falls Paper Company; Herbert E. Karberg, Alliance Paper Mills, Ltd.; Verne E. Kirby, St. Mary's Kraft Corporation; Theodore E. Kloss, Maine Seaboard Paper Company; Homer Latimer, Champion Paper & Fibre Company; Elmer M. Leavitt, Hollingsworth & Whitney Company; Charles J. Ludwig, Mead Corporation; D. C. Metcalf, Brown Paper Mill Company, Inc.; Earl Otto, Consolidated Water Power and Paper Company; Roland A. Packard, Smith Paper, Inc.; Alfred B. Perlick, Kalamazoo Vegetable Parchment Company; Charles H. Reese, Nekoosa-Edwards Paper Company; Gordon Singletary, Brunswick Pulp and Paper Company; Harold A. Skinner, Marathon Paper Mills Company Rudolph J. Sprang, Champion Paper and Fibre Company; H. Drew Stroup, West Virginia Pulp and Paper Company; G. Harold Suhs, Sorg Paper Company; Glen Sutton, Sutherland Paper Company; Killey E. Terry, S. D. Warren Company; Vernon L. Tipka, Hawley Pulp and Paper Company; Daniel J. Walsh, Parker-Young Company; C. E. Youngchild, International Paper Company.

Industrial Affiliates: J. M. Booth, Huron Milling Company; Olin W. Callighan, Edgar Brothers Company;

Fred H. Denham, R. T. Vanderbilt Company; T. E. Dial, Socony-Vacuum Oil Company; John C. Dieffenderfer, Hercules Powder Company; C. V. Douglas, Diamond Alkali Company; H. E. Dustan, Monsanto Chemical Company; Ivar Ekholm, National Aniline Div., Allied Chemical and Dye Corporation; J. T. Flahiff, Anheuser-Busch, Inc.; Lawrence Gussman, Stein Hall Manufacturing Company; Samuel Harkavy, Geigy Company; Ralph W. Kumler, American Cyanamid and Chemical Corporation; O. F. Lane, E. I. DuPont de Nemours & Co.; M. J. McCombs, Niagara Alkali Company; R. B. Martin, Wallace & Tiernan Company; R. W. Miller Pittsburgh Plate Glass Company; David E. Milne, English China Clays Sales Corporation; Walter B. Morehouse, National Oil Products Company; Wm. Mueller, Corn Products Sales Company; David Murchison, Georgia Kaolin Company; C. J. O'Neill, Johns Manville Sales Corporation; C. F. Radley, Oakite Products, Inc.; F. A. Soderberg, General Dyestuff Corporation; A. H. Stanton Magnus Chemical Company; B. F. Steele, Pennsylvania Salt Manufacturing Company; O. R. Steffins, Penick & Ford, Ltd.; R. M. Upright, Dow Chemical Company; A. F. Wieland, A. E. Staley Manufacturing Company.

This Chemical Group Task Committee is now at work collecting information for the preparation of a booklet on "Practical Application of Chemicals in the Manufacture of Pulp and Paper."

Following the first meeting held in New York on March 29 the members of the Task Committee met on April 25 in New York and on May 23 in Chicago.

New Robot Oil Reclaimer

The Youngstown Miller Company, Sandusky, Ohio, announce that their Bulletin YM-700 covering their new Robot Oil Reclaimer is now available.

The Robot employs the process that this company has used in batch oil reclaimers for over ten years — with the new feature that operation is now automatic and continuous.

These units are capable of restoring all kinds of lubricating, hydraulic, cutting and vacuum pump oils so that the reclaimed oil can be re-used in the same manner and place as the new oil.

Operators of Diesel engines will find that a single Robot can take care of all their Diesel engines.

HISTORICAL HIGHLIGHTS OF PAPERMAKING NO. 2

Across the Isthmus by Ox-Sled

By ship to Panama . . . across the Isthmus by ox-sled . . . then by schooner to Bolinas . . . where again ox-sleds hauled it along mountain ridges to the site of the tiny mill in Taylorsville, California.

Such was the hazardous trip of the first paper machine shipped west of the Mississippi. It was in 1853 during the great Gold Rush. Adventurous Americans by the thousands had made the long trek to California by covered wagon, by horseback, and by boat around the Horn, in quest of their fortunes.

With this rush of population came the need for paper. Mills sprang up, made paper by hand but couldn't begin to meet the demand. A paper machine was needed and Sam Taylor of Taylorsville sent his order to a Connecticut concern. It seemed an impossible order, but they delivered. Americans are like that.

☆ ☆ ☆ ☆

Back in those days Cheney Bigelow was a veteran of over ten years' experience in building mill equipment. We made the Fourdrinier wires for some of the great pioneering ventures of the Industry. Today after more than one hundred years of experience, we continue to furnish the trade with the latest developments of our research, while engaged in the production of vital war equipment.

CHENEY BIGELOW

Fourdrinier Wires · · Dandys · · Cylinders · · Wire Cloth

CHENEY BIGELOW WIRE WORKS · 417 LIBERTY STREET · SPRINGFIELD, MASS.

PAPER
TRADE JOURNAL
Title Reg. U. S. Pat. Off.
Henry J. Berger, Editor

COMING EVENTS IN PAPER INDUSTRY

New England Section. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

Delaware Valley Section. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

Lake States Section. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

Kalamazoo Valley Section. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

Chicago Professional Paper Group—First Monday of each month except July and August at Chicago, Ill.

MANPOWER UTILIZATION

Displacement of manpower in the paper industry made necessary by the war has been and continues to be a major problem. The paper industry has been quite successful in meeting this labor shortage in most of, if not in all departments. The case histories of how some mills have devised improved and labor-saving methods, have appeared before in the Paper Trade Journal. A more complete presentment of case histories has just been published by the War Manpower Commission, 1778 Pennsylvania avenue, N. W., Washington 25, D. C. The title is "Industry Manual of Manpower Utilization Case Histories." The survey includes paper and allied products, twenty-five other major industries and services and wholesale and retail trade.

In his introductory letter, B. R. Ellis, in charge of Forest Industries for the Industry Associations Committee of the War Manpower Commission points out that, "Better training, new machines, a close study of the reasons for absenteeism, a better understanding of workers' problems, the expanded use of older people, and women, have all greatly helped the situation of manpower where the producer has vigorously applied himself to the job." This study presents a case history report for the pulpwood industry by the Timber Production War Project of the Forest Service; the report for the Paper and Pulp Industry by the American Paper and Pulp Association; the report for the Paper and Pulp Industry by the Brown Company; the report by the National Paper Box Manufacturers Association, and the report by the Paper Stationery and Tablet Manufacturers Association.

Improved equipment figures largely in the case histories. By the installation of a rotary bark screen at a cost of $6,546, one mill effected a manpower saving of 16 men. Through the purchase of a crane and grapple to reclaim wood from piles, at a cost of $9,959, the manpower saving was 24 men. The pulpwood procurement plan inaugurated by J. H. Allen, president of the Florida Pulp and Paper Company is described as follows: Step 1, six men fell and trim the trees and leave them in tree lengths. Step 2, five men and five tractors skid the tree lengths logs to the cutter and loader. Step 3, one man loads the tree length on the conveyor to the cutter by means of a power cross haul. Step 4, six men operate the cutter and loader. Step 5, four men operate six trucks on a 25-mile haul. Investment, about $20,000. Results, 40 cords of pulpwood per day laid down at the pulp mill. Cost, $6 per cord, without stumpage. In Step 1, the trees are cut on a selective basis to insure a continuous supply of wood and care is taken to fell the trees so they will be as accessible as possible for the tractor that does the skidding. In some cases the reinstallation of equipment has resulted in manpower saving. For example, in one mill the broke is fed from the finishing room level and a conveyor carries the pulpwood broke to a wooden tank where it is reduced to suitable consistency for pumping to the beater room, saving five men. The equipment for this was available at the mill. The estimated cost if purchased new, $10,000.

Effecting saving in manpower by better methods, has been a very successful means of meeting the labor shortage and increasing the operating efficiency of many paper mills. An example of this type is that of ream wrapping. One mill reports that its practice of ream wrapping has been changed to ream banding or ream marking and while the number of workers formerly employed varied, the saving under the new practice saves about 50%. The only difficulty experienced has been sales resistance and this has not been too important. It was found that much paper that was customarily ream wrapped was not sold at retail but went to users who used a bundle or more at a time and ream banded or ream marked was just as satisfactory a method as ream wrapped. In the rag sorting department of one mill, the manpower saving of 21 women workers was effected. Formerly, 23 women were needed to sort rags. By a change in procedure and by mechanization the number was reduced to two.

The Brown Company reports that small tractors with drags to pick up stranded wood left on river flats are fast and two men and a tractor can do the work of 20 men dragging pulpwood bolts to the river. With several drags the work can be speeded up as no men are required for dumping in most cases. In one book paper mill the installation of a wrapper sealer and carton sealer effected a manpower saving of 10 to 12 girls. One pulp mill reports that pulp handling on its numbers 2 and 3 dryers formerly required 24 men. By installing gravity and power conveyors and stackers at a cost of $7,237, the job is now done with fifteen men.

Absenteeism has been quite a difficult problem to meet both in the woods and in the mills. Publicity in informing workers that the labor they are engaged in is highly essential to the war effort, has in most cases been successful. In commenting on record types

of absenteeism the survey discloses that one mill, starting April 1, has kept a weekly record of all types of absenteeism. These records are turned over to the plant nurse who follows up all cases due to ill health. The department foremen follow up on other chronic cases. Attempts are also made to discourage absenteeism as far as possible through posters, literature, etc. Since no records were kept prior to April 1, no comparable figures are cited. However, absenteeism has decreased since as follows: April, 3.54; May 2.17, and June, 2.10.

In reference to labor-management committees the survey states one mill reported: To take care of absenteeism and turnover we have adopted the Labor-Management Committee Plan whereby the committee thoroughly investigates each case. Although our record has been good, we feel it would get out of line if it were not for this committee. The practice to follow up interviews two weeks after hiring and exit interview at time of release, have been held to determine employee attitudes and to secure information useful in reducing absenteeism and turnover. Some quits have been salvaged, numerous minor irritations have been brought to light and we believe that our labor-management relations have been improved.

I. P. Affects Wage Agreements

[FROM OUR REGULAR CORRESPONDENT]

GLENS FALLS, N. Y., July 3, 1944—Following a conference here between representatives of the International Paper Company and delegates from labor organizations it was announced that all employees with over five years of service would receive vacations with pay. The wage agreements arrived at will affect upwards of 2,500 workers in the mills of the company located at Palmer, Niagara Falls, Tonawanda, Livermore Falls, Me., and Yorktown, Pa. Employees entering the armed forces will be given vacation pay at the time of their induction. It was also agreed to make application to the War Labor Board to grant general increases of two cents per hour to workers in the Niagara Falls and Tonawanda plants. Delegates of the other mills approved this move because of different labor situations and the higher cost of living in those two districts. Officials also agreed to observe a pension plan for retired employees and the present labor agreement was extended to June 1, 1945.

An official of the International Brotherhood of Pulp, Sulphite and Paper Mill Workers said after the session that the conference was constructive and good feeling prevailed throughout. The delegates represented the unions from the book and bond and groundwood specialties divisions.

Graphic Arts Elect Paper Men

BOSTON, Mass., June 26, 1944—At a meeting of the Graphic Arts Institute, Inc., June 22, William H. Walpole, assistant-treasurer, Rutter & McNaught, Inc., was re-elected a member of the board of directors and Arthur V. Howland, vice-president and assistant-treasurer, Tileston & Hollingsworth Co., was re-elected chairman of the budget committee. Both are members of the Fine Paper Division.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1944		Corresponding Weeks—1943	
May 20	91.6	May 22	92.2
May 27	91.7	May 29	91.8
June 3	88.3	June 5	84.7
June 10	91.5	June 12	88.0
June 17	92.8	June 19	87.0
June 24	92.4	June 26	87.0

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1943	87.2	88.9	89.5	88.7	91.4	84.8	84.3
1944	89.6	89.6	90.1	89.5	90.9	...	...

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1943	91.0	88.3	89.6	89.6	82.0	87.8

COMPARATIVE YEARLY SUMMARIES

	1937	1938	1939	1940	1941	1942	1943	1944
Year to Date....	89.1	67.4	79.5	87.0	93.5	99.1	88.8	90.5
Year Average....	79.8	71.5	83.4	85.6	97.4	90.4	87.8	...

* Based on tonnage reported to American Paper and Pulp Association. Does no include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS†

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1938	56	63	63	60	60	59	59	69	70	73	67	61	64
1939	65	73	76	74	69	73	68	77	82	91	88	77	77
1940	78	75	74	76	82	85	77	79	78	85	83	77	78
1941	81	88	89	89	91	94	92	98	95	99	98	90	92
1942	102	101	101	95	82	72	68	75	76	81	82	77	84
1943	86	88	94	94	96	94	89	96	94	94	93	87	93
1944	90	96	95	96	96								

Week ending May 20, 1944—97
Week ending May 27, 1944—96
Week ending June 3, 1944—93
Week ending June 10, 1944—96
Week ending June 17, 1944—95
Week ending June 24, 1944—96

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.

Publishers Urged to Use Less Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., July 5, 1944—Harold Boeschenstein, acting director of the Forest Products Bureau of the War Production Board, said today that the Printing and Publishing Division had received a report dated June 22 from a special newspaper publishers' task group recommending in substance that users of 30-pound newsprint be required to reduce their use of such paper manufactured after July 1 by 6.75% under that allowed under present newsprint Limitation Order L-240.

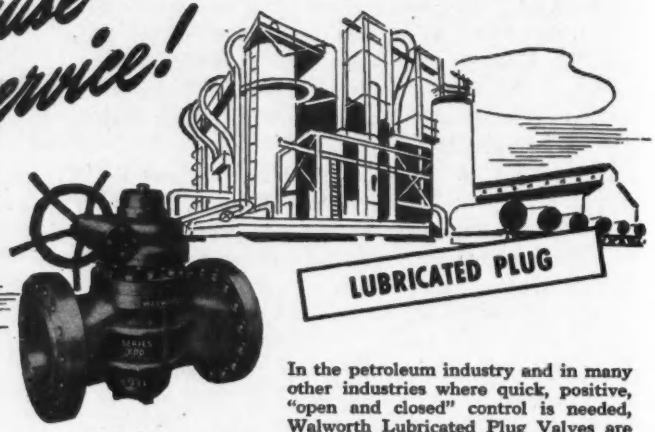
The effect of this proposal is to remove the advantage of additional yardage now available to users of 30-pound newsprint, who pay a $4 per ton higher price. This advantage has been at the expense of the total newsprint supply by the United States from Canada. The proposal would apply whether publishers order from Canada, the United States or Newfoundland.

Mr. Boeschenstein said the War Production Board had also been advised by the Canadian Government that the continuation of 30-pound orders will, of necessity, reduce their newsprint commitment to the United States by 10,000 tons per month effective July 1. He pointed out that such a shrinkage in supply would make inevitable a further reduction in usage by all publishers subject to L-240.

The recommendation of the task committee will be presented to the Newspaper Industry Advisory Committee at its next meeting, but it is expected that the War Production Board will amend the present order putting into effect the recommendations with respect to 30-pound newsprint. Mr. Boeschenstein advised users to consider immediately their orders for manufacture after July 1 in the light of this expectation.

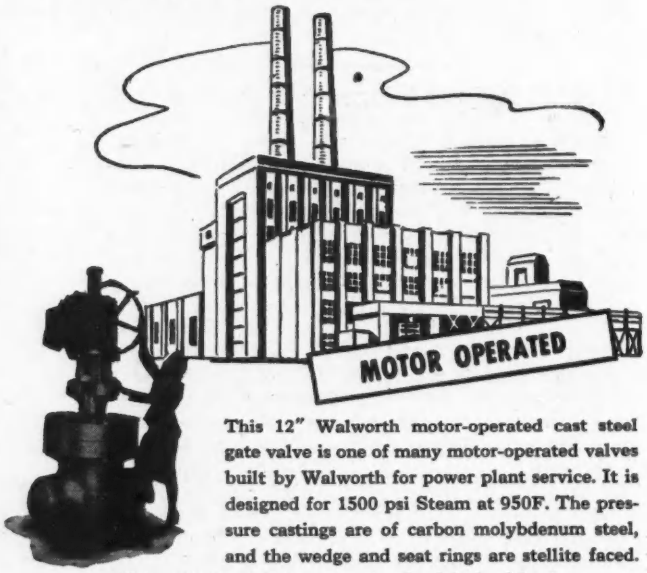
WALWORTH STEEL VALVES

Specified because they fit the service!



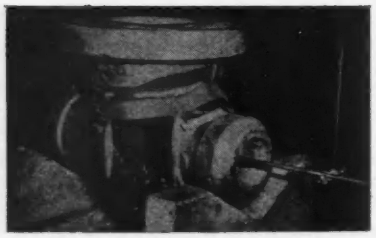
In the petroleum industry and in many other industries where quick, positive, "open and closed" control is needed, Walworth Lubricated Plug Valves are widely used. This one shown is a worm gear operated, steel, ball bearing type valve for 600 psi. Other Walworth Steel Lubricated Plug Valves are made in sizes from ½" to 24", for pressures from 125 to 5000 psi, and for vacuum.

Walworth manufactures gate and globe type cast steel valves for 150 to 1500 psi Steam;—Oil, Water, and Gas pressures up to 5000 psi. The Walworth Series 300 gate valve shown is made in sizes from 2" to 24". Its streamlined ports, deep stuffing box, oversize stem, and heavy wall thickness assure long and reliable service.



This 12" Walworth motor-operated cast steel gate valve is one of many motor-operated valves built by Walworth for power plant service. It is designed for 1500 psi Steam at 950F. The pressure castings are of carbon molybdenum steel, and the wedge and seat rings are stellite faced. Walworth Steel Valves can be furnished with air, gas, or electric motor operating units and with or without by-passes as required.

RADIOGRAPHIC INSPECTION



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Edited by R. G. Macdonald, Secretary

Developments in the Physical Testing of Paper During 1942–1943*

By B. W. Scribner[1]

This is one of the reports of developments relating to paper and paper products prepared annually by chairmen of committees of the Technical Association of the Pulp and Paper Industry. The report does not include mention of microscopy nor the testing of optical and printing properties as these are dealt with by other committees. It covers the literature on the subject that has come to the author's attention during the period November, 1942, to October, 1943, inclusive.

Resistance to permeation by fluids received much more attention than any other property. No doubt this is partly due to the exacting demands in the packaging of overseas shipments. The majority of the articles dealt with testing for permeability to water vapor. An anonymous writer described the design and operation of the GFMVT cabinet designed by C. A. Southwick, Jr., for testing water vapor transmission at high temperature and humidity, i.e. 100°F. and 95% humidity *(1)*. Symington and Burroughs also gave such information on this cabinet together with test values obtained with it *(2)*. One of the Instrumentation Studies of the Institute of Paper Chemistry dealt with the problem of testing for water vapor permeability as a whole and suggestions were given for an improved testing method *(3)*. Schütz and Schröter describe a method for this purpose in which silica gel is used as the desiccant *(4)*. A method for the measurement of air permeability at low temperature was described by Molodkewitsch *(5)*. Codwise presented a rapid test for degree of internal sizing based on flotation on water at temperatures up to 212° F., and included test data obtained with it on a wide range of paper products *(6)*. Cameron and Kenyon improved the reproducibility of the Barss, Knobel, and Young newsprint penetration tester by the installation of a rheostat-potentiometer in the electrical circuit *(7)*. Lane devised apparatus for measurement of oil permeability *(8)*, and used it in a study of the relation between oil permeability and air permeability. For the papers tested the latter was the greater *(9)*.

The Institute of Paper Chemistry issued four reports dealing with measurement of the tensile strength of paper. One report dealt with general considerations of factors affecting the test results obtained with various types of apparatus, such as method of calibration effects of rate of loading, specimen length, and specimen width. It was found that the test values increase as the rate of loading increases and decrease as the specimen length decreases, and that apparently the relative tensile strength should be independent of specimen width for wide specimens, but that it should decrease rapidly for widths less than about half an inch *(10)*. The other three reports gave the result of investigation of the accuracy of test data obtained with the Scott serigraph Model J 3 instrument *(11)*, the Amthor universal instrument *(12)*, and the Schopper electrically-driven instrument *(13)*. The chief errors found in the calibration of all of these instruments were caused by inaccuracy in division of the scale which can readily be remedied by the manufacturers. Pellinen found that tensile strength is inversely proportional to moisture content, except for sheets having 30 to 120% moisture, and the kind and degree of beating determines the amount of water absorption under given atmospheric conditions *(14)*.

Formulas, whereby the work involved in the change of shape of the membrane in the bursting strength test can be calculated, were developed by Burgstaller *(15)*. Finch found that thickness measurements made with the pressure-adjusted machinist's micrometer and those made with a dead-weight dial micrometer agreed very closely *(16)*. Further investigation of measurement of the curl of paper was made by Carson and Worthington. Measurements were made of the relative curliness of a number of lithographic papers, using a modified form of the curl sizing tester developed by them, and they found good correlation of the curl values with behavior of the papers in use *(17)*. Van den Akker, Root, Carleton, and Wink described an improved form of the Neenah expansimeter. With the new device, determinations of hygroexpansivity may be made simultaneously for twenty test specimens *(18)*. An instrument and a procedure for measuring the stiffness of paper were developed by Sharman. The method is based on measuring the curvature of a sheet produced by the application of a couple of bending movements, one in a plane parallel and one perpendicular to the machine direction *(19)*.

* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 14-17, 1944.

[1] Member TAPPI; Chairman, TAPPI Paper Testing Committee; Chief of Paper Section, National Bureau of Standards, Washington, D. C.

The following new TAPPI methods were published: Flammability of Treated Paper and Paperboard, T 461 sm-43 *(20)*; Air Permeability of Paper, T 460m-43 *(21)*; Adhesiveness of Gummed Tape, T 463m-43 *(22)*. The method for flammability is for so-called flameproofed papers which have been treated to minimize the spread of flame when ignited. The method for porosity is applicable to flat papers which permit the passage of 100 cc. of air in 2 to 30 seconds. The method for adhesiveness of gummed sealing tape is based on the use of the Harnden-McLaurin apparatus for testing sealing tape not less than 2 inches wide used in sealing fiber shipping containers. A complete report of the activities of the TAPPI Paper Testing Committee for the year was given by Scribner *(23)*.

Tests for Specific Products

Relative to tests designed for specific products, much attention was given to the testing of fiber shipping boxes as they have largely replaced wooden shipping boxes for both domestic and overseas shipments. Special types of "weather-proofed" paper boxes have been developed which are resistant to the most extreme warfare conditions, including being floated ashore in surf during landing operations. An anonymous writer *(24)* and Malcolmson *(25)* described the testing of such boxes by anchoring packed boxes in surf where they would be beaten back and forth for 24 hours, then dropping them a distance of 9 feet onto concrete. Quinn discussed the various laboratory tests applied to paper containers comprising drop tests *(26)*, and bursting strength of the board *(27)*. A simple device for making a crushing test of corrugated boards termed the "nutcracker," was described by Drewson *(28)*, and he also discussed the variables in the crush test *(29)*. A progress report on a study being made at the Institute of Paper Chemistry of the testing of corrugated container board was given by Wells, Kaplan, and Agers. The work so far done indicates that the Beach puncture tester is superior to the Mullen tester for testing the board as a whole, but that the latter is of value for testing the flat stock. They also found the crush test to be of value *(30)*. Wright described "rough-handling" tests of wooden shipping boxes *(31)*. Little found that the compression strength and stiffness factor of corrugated board are related to the Olsen compression test in a definite manner, and, therefore, are a measure of that quality of corrugated board which, when made into boxes, enables it to withstand compressive forces *(32)*. Southwick gave a general discussion of the testing of packages and packaging materials *(33)* and also presented the plans of a committee appointed by the Packaging Institute to standardize such testing *(34)*. Instruments and procedures for testing paper container boards were described by Paris *(35)*.

Schmidt gives the results of experimental work on the improvement of the testing of envelopes. The methods found suitable for the purpose consisted in testing the envelope paper for tensile strength, bursting strength on creased and uncreased papers, folding endurance, and tumbling envelopes in a revolving drum *(36)*.

Charlton and Lovell devised an instrument for testing bottle cap liners. This is based on the principle that the effectiveness of the seal of a closure is a direct function of the pressure exerted by the cap, through the liner, against the edge of the aperture of the bottle. The instrument measures this pressure *(37)*.

An instrument to determine the moisture content of cardboard by measuring minute changes in its specific inductive capacity was devised by Gardner *(38)*.

Gummond and Duncan discussed new developments in the testing of paper over the period September 1, 1941, to Sept. 1 1942 *(39)*. Scribner gave his annual report on the developments in physical testing of paper *(40)*.

Literature Cited

1. *Modern Packaging* 16, No. 3: 78 (Nov., 1942).
2. *Fibre Container* 28, No. 4: 107 (April, 1943).
3. *Paper Trade J.* 116, No. 14: 11; No. 23: 10 (April 8, June 10, 1943).
4. *Chem.-Ztg.* 65, No. 97/98: 475 (Dec. 10, 1941).
5. *Papier-Fabr.* 41, No. 4: 29 (Feb. 25, 1943).
6. *Paper Trade J.* 116, No. 9: 30 (March 4, 1943).
7. *Paper Trade J.* 116, No. 18: 28 (May 6, 1943).
8. *Paper Trade J.* 117, No. 3: 26 (July 15, 1943).
9. *Paper Trade J.* 117, No. 3: 28 (July 15, 1943).
10. *Paper Trade J.* 115, No. 5: 12; No. 7: 14; No. 19: 18 (July 30, Aug. 13, Nov. 5, 1942).
11. *Paper Trade J.* 115, No. 26: 14 (Dec. 24, 1942).
12. *Paper Trade J.* 116, No. 6: 10 (Feb. 11, 1943).
13. *Paper Trade J.* 116, No. 9: 13 (Mar. 4, 1943).
14. *Finnish Paper Timber J.* 23, No. 15: 293 (Aug. 15, 1941).
15. *Papier-Fabr.* 40, No. 19/20: 75 (May 16, 1942).
16. *Bell Labs. Record* 21, No. 5: 121 (Jan., 1943).
17. *J. Research Natl. Bur. Standards* 30, No. 2: 113 (Feb., 1943).
18. *Paper Trade J.* 115, No. 24: 33 (Dec. 10, 1942).
19. *Proc. Tech. Sect., Paper Makers' Assoc. Gr. Brit. and Ireland* 23: 231 (Dec., 1942).
20. *Paper Trade J.* 117, No. 12: 28 (Sept. 16, 1943).
21. *Paper Trade J.* 117, No. 12: 27 (Sept. 16, 1943).
22. *Paper Trade J.* 116, No. 24: 23 (June 17, 1943).
23. *Paper Trade J.* 116, No. 10: 23 (Mar. 11, 1943).
24. *Fibre Containers* 27, No. 12: 36 (Dec., 1942).
25. *Fibre Containers* 28, No. 2: 10 (Feb., 1943).
26. *Fibre Containers* 27, No. 11: 45; 28, No. 2: 45; 28, No. 6: 53 (Nov., 1942; Feb., 1943; June, 1943).
27. *Fibre Containers* 27, No. 11: 45; 28, No. 9: 49 (Nov., 1942; Sept., 1943).
28. *Fibre Containers* 28, No. 1: 40 (Jan., 1943).
29. *Paper Trade J.* 116, No. 11: 39 (Mar. 18, 1943).
30. *Paper Trade J.* 116, No. 13: 29 (April 1, 1943).
31. *Modern Packaging* 16, No. 8: 176 (April, 1943).
32. *Paper Trade J.* 116, No. 24: 31 (June 17, 1943).
33. *Packaging Catalog*, 1943: 23.
34. *Modern Packaging* 17, No. 1: 86 (Sept., 1943).
35. *Papier-Ztg.* 67, No. 20: 454; No. 21: 475; No. 22: 494 (Oct. 10, 24, Nov. 7, 1942).
36. *Papier-Fabr.* 73, No. 15: 247 (Aug. 8, 1942).
37. *Modern Packaging* 16, No. 6: 86 (Feb., 1943).
38. *J. Soc. Chem. Ind.* 62, No. 5: 75 (May, 1943).
39. *Pulp Paper Mag. Can.* 44, No. 2: 164 (Feb., 1943).
40. *Paper Trade J.* 116, No. 10: 23 (Mar. 11, 1943).

Canada's Prospects Are Good

TORONTO, Ont., July 3, 1944 — Regardless of whether 30-pound newsprint is made in little or much volume in the near future, producers of newsprint in Canada stand to benefit more fully this year than in 1943 from the increases in prices that took place at different periods last year. Producers of sulphite pulp also stand to benefit from the increase in the United States price this year.

In the case of newsprint, it will be recalled that two advances in prices were put into effect in 1943: one of $4 on March 1, raising the price from $50 to $54 a ton, and a second one on September 1, another $4 boost, taking the price to $58 a ton. With this net advance of $8 a ton during the year, the average price for 1943 thus works out at $54.66 per ton. A price of $58 prevailing throughout 1944 should show an increase of $3.33 per ton on the average, or, including New York funds, of $3.66. The increase applies to all shipments to Canadian customers and to the major market, United States publishers.

So far as sulphite pulp is concerned, an increase of $8 a ton went into effect February 15 last and it is continuing as from that date. The increase from $66 to $74 a ton applies to the sulphite pulp exported to the United States. An addition of the payment in New York funds indicates an increase actually of $8.80 a ton.

Effect of Pulp Cation-Exchange Capacity on Engine Sizing*

By William S. Wilson[1]

Abstract

A method is suggested for the rapid determination of the number of bonds on a given pulp.. The sizeability of a pulp seems to be closely associated with the number of these bonds.

There are three reasons for giving this paper. The literature contains very little of the general type of data presented. An attempt is made to introduce numerical values for a variable heretofore scarcely mentioned, and finally, it is hoped that somebody skilled in determining pulp surface will get interested enough to go on from where these data end.

Mersize, a synthetic resin, seems to have excited considerable interest in the paper industry. As a result a series of pulps representing quite a range in type and locality have been run through the laboratory. Time has limited us to studying each furnish only in the immediate field prescribed by the donor. Possibly an intensive study of the individual pulps might eventually lead to complete understanding.

Unfortunately most of these pulps are mixtures. The results would have been more informative if only one pulp at a time had been used. Pulps were found which on mixing in various proportions give an ink penetration test which is a straight line function between the tests on the two individual pulps. Other pulps were found which deviate from a straight line function to a startling degree.

Determination of Pulp Bonds

The new variable just mentioned is the relative number of bonds on the various pulps. The author's tentative theory is that rosin and pulp are cation exchangers held together by Al ions common to both kinds of particles. If this is so then by converting the cation exchanger pulp to its hydrogen form and titrating the hydrogen ions, a measure of the number of bonds on the pulp is obtained. The units used are purely arbitrary. They are the number of ml of 0.1 *N* NaOH necessary to neutralize the H ions on 10 grams of pulp. The endpoint which has been chosen (10.5 pH) falls in the category of an educated guess (see note).

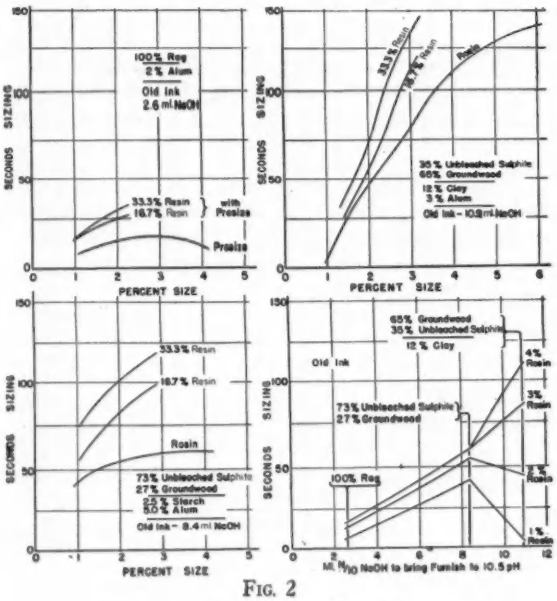

FIG. 2

The titration curves given in a previous paper *(1)* show that Ca ions are completely replaced by H ions at about 3.2 pH. Therefore to convert the pulp to the hydrogen form the pulp is washed with 3.0 pH water. Two washes with distilled water are made to remove the excess acid. It is just as dangerous to over-wash thereby losing hydrogen ions from the pulp as it is to underwash. The 10.5 pH endpoint is merely the best approximation to the point at which was found an increase in H ions equivalent to the number of Ca ions washed off at 3.2 pH. Caustic apparently keeps on reacting with cellulose above 10.5 pH hence the necessity of arriving at an endpoint by approximation.

The titrations are made in 500 ml. of distilled water. It takes 1.6 ml. of 0.1 *N* NaOH to raise 500 ml. of distilled water to 10.5 pH. This is the reason for deducting the 1.6 ml. at the 10.5 pH endpoint. Figure 1 shows titration curves for four different pulps and for pure water.

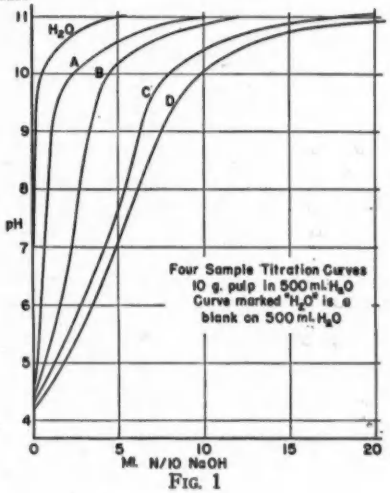

FIG. 1

Pulp Bonds vs Engine Sizing

A misfortune necessitated splitting the virgin pulp furnishes into two groups. This misfortune is rather interesting. It has always been possible to duplicate ink penetration tests on any given pulp even as far

* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 14-17, 1944.

[1] Research Director, Monsanto Chemical Co., Merrimac Div., Boston, Mass

apart as 2 years. After a few pulps in this series had been run the ink supplier changed the formula. It is suspected that this change was deliberate rather than by force of circumstances because three variables each leading to slower penetration were changed simultaneously.

Figure 2 shows sizing curves for three pulp furnishes tested with the old ink. The relative number of pulp bonds for the furnish are on each figure in the previously mentioned arbitrary units of ml. 0.1 *N* NaOH. The lower curve is for straight alkali dispersed rosin. The two other curves are for a sizing consisting of rosin, and 16 and 33% of the synthetic resin respectively. The amount of alum used is constant in any one figure but varies from figure to figure according to the donor's practice. Fortunately there are practically no instances of serious alum deficiencies. The pH of the stock was adjusted to 4 in all the sizing curves shown throughout this paper unless otherwise noted. All the sizing data reported are on handsheets and each sizing value plotted is the average of sixteen individual ink flotation tests.

In the fourth curve of Fig. 2 seconds sizing has been plotted against the relative number of pulp bonds for the furnishes shown in the other curves of the same figure. There are four lines, the lower for 1% rosin and higher ones for 2, 3 and 4% rosin. Obviously the sizeability of a pulp is more or less proportional to the number of bonds on it.

The spread in sizing for different amounts of rosin on the various pulps will be discussed later. On this figure the greatest spread is on a furnish containing considerable clay.

Figures 3 and 4 show sizing curves on another series of pulps tested with the new ink. Included on Fig. 3 is seconds sizing plotted against the relative number of pulp bonds for each furnish in this series.

Obviously the sizeability of a pulp in general increases with the number of pulp bonds present. Some of these pulps notably the 4.9 ml. one gets quite a

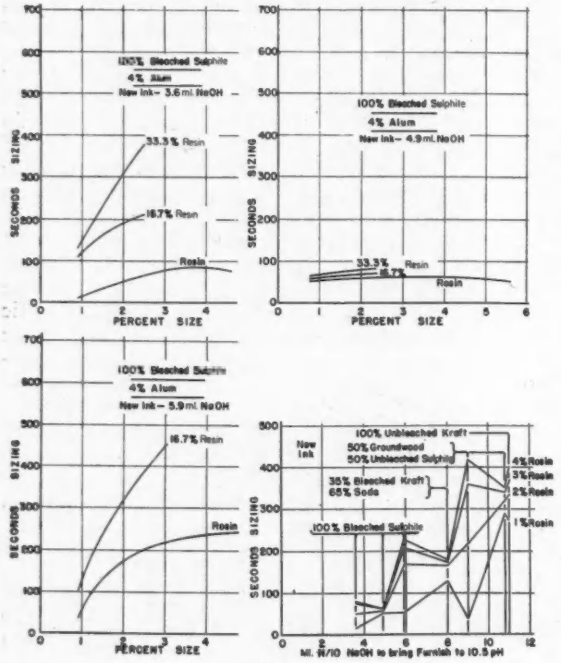

FIG. 3

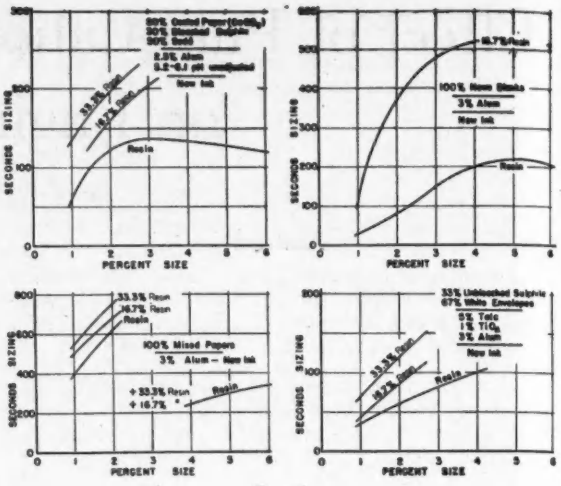

FIG. 5

kick out of 1% rosin. Further additions give a negligible increase. Does this mean small surface easily covered by 1% rosin? The 9.0 ml. pulp exhibits just the opposite effect. Does this mean a lot of surface which takes a lot of rosin to cover? Now the 9.0 ml. and the 10.8 ml pulps represent identical mixtures of the same two types of pulp from different sources. Is the difference one of surface? If not what is it? The two pulps originated a couple of hundred miles apart. No such generalizations can be made on the rosin-resin mixtures which rather substantiates the author's previously mentioned belief that local pulp bond densities are a special rather than a general characteristic of all classes of pulps.

The magnitude of the variations in sizing as the number of pulp bonds increases certainly indicates that subtle and obscure differences are not being considered and therefore untangling them should not be too difficult.

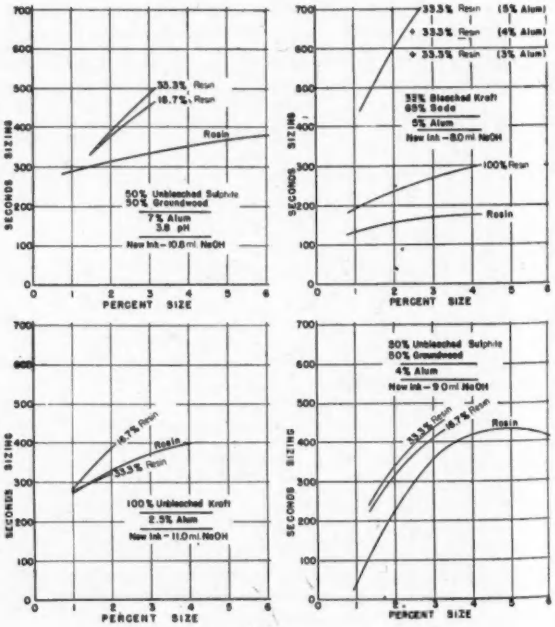

FIG. 4

Sizing Data

Because it is not yet known how to get a pulp bearing Al ions into its hydrogen form, all furnishes containing recovered paper are shown in a group by themselves, Fig. 5, and were left out of the final capitulation. The mixed papers curve represents a good example of the sizing variations with which the user of mixed paper has to contend. The sizings obtained with 1 and 2% size were all on stock from one laboratory beater of mixed paper. Those with higher percentages of size were all on stock from a second laboratory beater and in spite of the attempt that was made to select the same mixture of papers for this beater the sizings obtained were in an entirely different range.

The figure for news blanks is worthy of comment in that the furnish contained calcium carbonate from the coated paper used and unlike the other curves the pH was not adjusted to 4 and varied between 5.2 and 6.1 with different amounts of size added.

The sizing curves shown for two of the 100% bleached sulphites, the bleached kraft-soda, and the newsblanks certainly arouse one's curiosity as to what characteristic or characteristics these particular pulps, of widely different types, possess that places them at the top of the group tested in respect to the sizing increase obtained by the use of the synthetic resin with rosin. The author believes that the distribution of the pulp bonds is one of the important characteristics involved here.

Conclusions

In a previous paper *(2)* it was suggested that all so-called sizing tests measure the resultant of a series of variables and that each test accentuates or subdues each of these variables to a different degree. It appears that the indiscriminate lumping of all these empirical tests in the category of sizing tests has had a tendency to build up the idea that their improvement is merely a matter of changing the type or amount of rosin size. Certainly such an assumption is not substantiated by the curves just shown. There must be some fairly simple reasons why some pulps are densely covered and others sparsely covered with bonds.

In closing another variable is suggested which the author believes to be very important. Paper has apparently been considered only as a static capillary system. A few experiments recently run indicate that paper stock is a deteriorating capillary system and that sizing tests may measure the integrated rate of deterioration. In other words, the rate of penetration is really the rate at which the advancing front of the penetration liquid can wash off and/or hydrolyze the binding Al ions.

If this is so sizing should be a function of the number of usefully employed pulp bonds which must be thus destroyed. This easily accounts for the increased sizing due to an increase in the number of pulp bonds or the increased bond density of the special resin.

NOTE: The only conclusion drawn in this paper is that the relative sizeability of pulps increases as the relative number of bonds of the individual pulps increases. Inspection of the sample titration curves (Fig. 1) shows that the relative number of bonds is practically the same regardless of the hydrogen ion concentration chosen as the endpoint. The endpoint used in the paper is 10.5 pH but subsequent work has indicated that the true endpoint is nearer 8.0 pH.

Literature Cited

(1) Wilson and Duston, *Paper Mill N.* (Dec. 18, 1943).
(2) Wilson and Duston, *Paper Trade J.* (Nov. 18, 1943).

Sets Maximum Rosin Prices

All sales of gum rosin have been brought under dollars-and-cents per hundred pounds price ceilings with the issuance of a temporary 60-day regulation, designed to halt rapidly rising prices of the commodity, the Office of Price Administration announced on June 28. The temporary prices will be replaced by a permanent regulation to be issued at a later date.

Effective June 28, 1944, today's action sets the following ceiling prices per 100 pounds for 13 grades of gum rosin quoted on the Savannah, Ga., Cotton and Naval Stores Exchange: "G," $5.75; "F," $5.70.

For sales not made on the Savannah Exchange, the Exchange prices are used as a base, with adjustments according to the seller's differentials from those prices during the period June 23, 1944 to June 27, 1944, inclusive, the five days prior to issuance of the regulation.

Gum rosin, used in the manufacture of many essential products such as paper, soaps, and paints and varnishes, has been exempt from price control since June 19, 1942. The maximum prices established by today's action fulfill the requirements of the Emergency Price Control Act that prices set for agricultural commodities must reflect certain legal minimas, OPA said.

It became necessary to establish ceilings on gum rosin when uncontrolled prices rose to a point reflecting higher production costs for finished articles in which the rosin is used as raw material. This resulted in a squeeze on the established ceiling prices of the finished products, OPA said.

Discuss Paper Saving by Cities

Plans for saving paper through limitation of the printing of cities and municipalities and for easing restrictions on their construction projects were discussed today at the second meeting of the Advisory Committee to the WPB Government Division, the War Production Board has announced. The committee was formed last month.

Members of the committee attending today's meeting were Mayor Fiorello H. LaGuardia, of New York; Commissioner Albert Pleydell, of New York; Mayor Edward Wright, of Houma, La.; City manager L. P. Cookingham, of Kansas City, Mo.; City Manager H. A. Yancey, Greensboro, N. C.; Commissioner O. A. Dirkes, Spokane, Wash.; George F. Simmons, of Ogden, Utah, executive secretary and treasurer of the National Association of County Officials; Garrett Heyns, of Lansing, Mich., representing Leslie P. Kefgen, chairman of the Michigan Correction Committee, and Russell Clark, of Washington, D. C., representing Frank J. Walter, president of the American Hospital Association.

After hearing a discussion of proposals for limiting the printing of cities and other governmental units in order to save paper, a number of the members of the council said they would immediately inaugurate programs for saving up to 25 per cent of their paper consumption.

The members of the committee also endorsed a proposal that would ease wartime restrictions on their building programs, now limited to proposals directly helpful to the war effort.

Under the proposal they would also be permitted to undertake projects that do not interfere with the war effort.

A Study of Certain Routine Kraft Mill Analytical Control Methods*

By P. B. Borlew[1] and T. A. Pascoe[2]

Abstract

There are several methods which are used for the routine analyses of sulphate mill green and white liquors. Because of differences in results obtained by the varied procedures, their reliability was checked against analyses made by independent methods. The procedures given in TAPPI Tentative Standard T-624 m-42, First and Third Editions of "The Manufacture of Pulp and Paper," and two others occasionally used were investigated.

This study was limited to an examination of several variations of the common differential acidimetric titrations used for the routine analysis of sulphate mill green and white liquors. It was found that changes in the details of these general methods resulted in substantial differences in the results obtained on the same liquors. These findings required that the work be carried farther to establish the soundness of certain procedures and to discard the other practices. The differential titration methods have the inherent characteristic that the three main constituents are determined by using differences. Because of this fact it was necessary to determine two of the three constituents by independent methods before the accuracy of the routine methods could be established.

Published information dealing with the adaptation of the general titration method to the problem of the analysis of kraft mill liquors is very scattered and small in total amount. There is a particular lack of published information on the background work done in evolving the methods that have been published. It is known in the industry that methods were often adopted in this field without the benefit of critical preliminary groundwork. The adoption of changes in minor manipulative details was often made in the interest of routine operations.

Kress *(1)* is usually credited with being one of the first in this country to call attention to the acidimetric method for the determination of caustic soda, soda ash, and sodium sulphide in kraft mill green and white liquors. Nielsen *(2)*, Bergman *(3)*, and Oeman *(4)* published the results of foreign studies on the analysis of white and green liquors. Griffin *(5)* and "The Manufacture of Pulp and Paper" First and Second Editions, collected the methods in current use.

The Third Edition of "The Manufacture of Pulp and Paper" gave a method differing in some of the details from that in the earlier editions. Very recently Moltzau *(6)* and the TAPPI Committee on Standard Methods *(7)* have recommended further modifications. Incidental to another investigation, it was noted that certain variations in the general method gave significantly different results on the same mill liquors.

[1] Member TAPPI; Assistant Research Director, Nekoosa-Edwards Paper Co., Port Edwards, Wis.
[2] Member of TAPPI; Technical Director, Nekoosa-Edwards Paper Co., Port Edwards, Wis.
* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 14-17, 1944.

The various modifications of the general method studied are outlined in their essential details in Table I.

In Table I, methods 1 and 4 were "unofficial" variations that had been used to some extent in routine and special analyses. Method 3 was taken essentially from "The Manufacture of Pulp and Paper" First and Second Editions, while method 2 was from the Third Edition of the same book. Method 5 is essentially the very recently proposed TAPPI Tentative Standard T-624 m-42.

In the final column of Table I, the notations designating the various steps in the titration are as follows:

A = Phenolphthalein end point titration on original liquor.
B = Methyl orange end point titration on original liquor.
C = Methyl orange end point titration on liquor after $BaCl_2$ addition.
D = Phenolphthalein end point titration on liquor after $BaCl_2$ addition.

A general examination of the several methods would lead to the logical conclusion that with the use of the proper factors, similar results would be expected through the use of any of the methods on the same liquor.

TABLE I.—SHOWING DETAILS OF THE DIFFERENT TITRATION PROCEDURES STUDIED

Method	Sample Details: Volume of Mill Liquors Taken, ml.	Initial Sample Dilution, ml.	Titration Sample Taken, ml.	Titration Sample in Terms of Original Mill Liquor, ml.	Normality of Acid	Ratio of Volumes of (20%) $BaCl_2$ Solution to Original Mill Liquor Sample	Steps in Titration Used to Calculate Results
1	10	250	25	1.0	0.1	2.5:1	ABC
2	50	250	25	5.0	1.0	2.0:1	ABC for $BaCl_2$ precipitation
	5	0	0	5.0	1.0	0	ABC
3	10	250	25	1.0	0.5	Unspecified	BCD
4	25	250	50	5.0	0.5	4:1	BCD
5	25	500	50	2.5	0.5	0.5:1	BCD for white liquor
	25	250	50	5.0	0.5	2.0:1	BCD for green liquor

Table II shows the results obtained on a typical green liquor using methods 1, 2, and 3. The lack of agreement between the various methods shows the need for the use of reference methods to establish a correct procedure.

Reference Methods

Some preliminary work on the problem of determining Na_2S in kraft black liquor had indicated that an evolution methods using CO_2 as the reagent to release the H_2S was possible. Check tests on synthetic "white" and "green" liquors of known composition showed a satisfactory accounting of the Na_2S content, especially after the adoption of a modification suggested by Berl *(8)* consisting of the addition of Ca ions to the reaction mixture. It is common practice to use strong acids to liberate H_2S from sulphides. The published literature, however, shows that little is known about the use of CO_2 or H_2CO_3 for the same

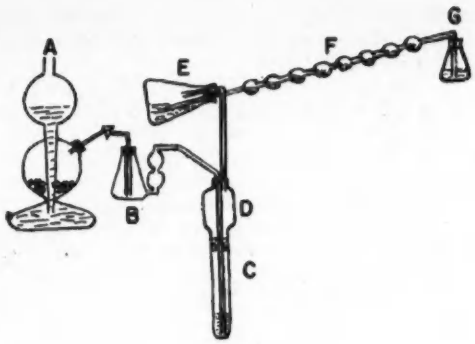

FIG. 1

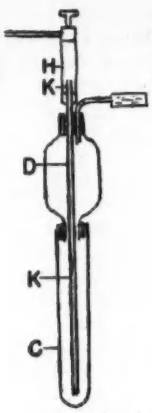

FIG. 2

Hydrogen Sulphide Evolution

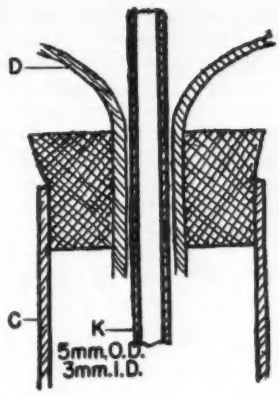

FIG. 3

purpose. Schwalbe-Sieber *(9)* described a similar method involving the continuous addition of $MgCl_2$ to the reaction flask.

SULPHIDE SULPHUR DETERMINATION

The sulphide sulfur determination was carried out as follows: (See Fig. 1.) A Kipp generator (A) supplied CO_2. An Erlenmeyer flask (B) with absorption bulbs containing a saturated $NaHCO_3$ solution served to trap HCl from (A). A long tube (K) reached to the bottom of the large test tube (C). This tube (C) is the reaction vessel and communicates through a slit between the tube (K) and the foam trap (D) (Figs. 2 and 3.) The outlet tube from the foam trap was connected with an Erlenmeyer flask into which the Meyer absorber (F) was inserted. The absorber was charged with 50 ml. of 0.1 *N* iodine solution. Finally a small flask (G) containing a known amount of standard thiosulphate solution served to trap any iodine from the absorber.

The sample of white, green, or black liquor is placed in (C) together with a few drops of glycerol. The latter reduces the danger of oxidation of the sulphur compounds. One to 2 grams of $CaCl_2$ are added to the reaction mixture. The total volume in (C) is kept around 20 ml. Experience has shown that the CO_2 stream passing through the apparatus for an hour serves to liberate the inorganic sulphides and transfers the liberated H_2S to the absorber. At the end of the test, the absorber contents together with the trap (G) are washed into a beaker and the excess iodine determined using 0.1 *N* thiosulphate solution.

TABLE II.—GREEN LIQUOR COMPOSITION

Method		No. 1		No. 2		No. 3	
Steps used in Calculation	Evolution	ABC	BCD	ABC	BCD	ABC	BCD
Na_2CO_3, g./l.	137.5	138.2		138.2		138.5	
NaOH, g./l.	...	26.4	26.0	26.8	20.8	26.4	18.8
Na_2S, g./l.	39.8	30.4	31.2	34.7	39.0	29.8	38.2

A suitable sample for analysis is obtained by diluting 10 ml. of the mill liquor to 50 ml. and using 10 ml. of the diluted sample. The absorber liquid at the end of a test will often contain particles of sulphur of such size that iodine will be occluded. Iodine so held is slow to react in the final titration. It has been found advantageous to collect such sulphur particles and dissolve the sulphur using CS_2. The occluded iodine can then be titrated in a separate titration and the final results corrected. This procedure was recommended by Treadwell *(10)*.

Blank tests made on Na_2S solutions of known sulphide content gave very satisfactory recoveries. Blank tests on solutions containing Na_2SO_3 proved that the conditions in the reaction vessel are such that sulphur dioxide will not be carried over to the absorber or otherwise interfere with the sulphide determination.

CARBONATE DETERMINATION

The problems involved in the precise determination of carbonate have received a great deal of attention. There are numerous reliable methods available. One of the most common involves the evolution and measurement of CO_2 liberated from the carbonates after the addition of acid. The apparatus used was essentially a standard CO_2 absorption "train". In Fig. 4 (A), (E) and (K) are Stettson-Norten modified Midvale absorption towers filled, respectively, with

TABLE III.—COMPARATIVE ANALYSES OF MILL GREEN LIQUORS

	Evolution Method	Method 5	Deviation from Evolution Method	Method 3	Deviation from Evolution Method	Method 2	Deviation from Evolution Method	Method 2	Deviation from Evolution Method
Na_2CO_3, g./l.									
Dec. 21, 1943	128.5	130.5	+ 2.0	128.2	— 0.3	131.8	+ 3.3		
Jan. 4, 1944	122.1	121.0	— 1.1	120.3	— 0.18	125.1	+ 3.0		
Jan. 10, 1944	128.9	131.7	+ 2.8	133.2	+ 4.3	132.4	+ 3.5		
Jan. 15, 1944	111.8	108.8	— 3.0	109.9	— 1.9	112.8	+ 1.0		
Jan. 18, 1944	110.2	112.0	+ 1.8	112.4	+ 2.2	115.1	+ 4.9		
Na_2S, g./l.		BCD		BCD		BCD		ABC	
Dec. 21, 1943	33.8	32.7	— 1.1	31.2	— 2.6	33.5	— 0.3	26.6	— 7.2
Jan. 4, 1944	37.6	39.0	+ 1.4	37.2	— 0.4	38.3	+ 0.7	31.8	— 5.8
Jan. 10, 1944	31.8	33.0	+ 1.2	31.7	— 0.1	32.7	+ 0.9	17.9	—13.9
Jan. 15, 1944	38.0	36.6	— 1.4	33.2	— 4.8	35.5	— 2.5	29.6	— 8.4
Jan. 18, 1944	38.6	35.3	— 3.3	33.8	— 4.8	37.2	— 1.4	28.3	—10.3
NaOH		BCD		BCD		BCD		ABC	
Dec. 21, 1943	....	24.0		24.8		22.8		29.8	
Jan. 4, 1944	....	19.2		23.3		21.5		30.6	
Jan. 10, 1944	....	21.2		21.0		22.4		37.6	
Jan. 15, 1944	....	17.9		20.8		18.3		24.4	
Jan. 18, 1944	....	25.7		27.1		24.7		33.9	

Ascarite, $CuSO_4$-Pumice, and Ascarite. Flasks (B), (D), and (G) contained, respectively, the decomposing acid, nothing, and sulphuric acid. The U-tube contained $CaCl_2$; glass tube (F) with stopper was a safety device to guard against the return of acid into (E). Flask (D) is cooled with a bath. The reaction flask (C) has a capacity of 250 ml.

To carry out a determination with white liquor, 15 ml. of conc. HCl were diluted to 50 ml. with CO_2-free distilled water and placed in (B). For green liquor it was convenient to use 50 ml. of *N* HCl in (B). For green liquor the sample chosen was 4 ml. (dilute 20 ml. to 100 ml. and use 20 ml.). For white liquor 20 ml. of the mill strength liquor were used. The liquor sample was placed in (C). For a green liquor test 1.5 grams, for white liquor 5 grams, of $K_2Cr_2O_7$ were dissolved in a minimum of water and placed in (C). The $K_2Cr_2O_7$ oxidized the greater part of the Na_2S and Na_2SO_3 later after the addition of acid. After making all connections tight with collodion, suction was applied to the outlet of (K). The acid in (B) was drawn into the reaction flask (C) to start reaction. One-half hour has proved an adequate period to release and collect the CO_2 from the usual sample. During this period the reaction mixture was heated to boiling. The particular absorption tower recommended is a very handy and reliable device to collect and weigh CO_2.

Comparison of Titration Methods

With reliable reference methods available to establish two of the three main constituents present in green and white liquors, it was possible to proceed with a comparison of the various acidimetric titration methods. Method 1 (Table I) was eliminated because the original sample taken was too small, thus increasing the effect of variations in measuring the sample. The use of 0.1 *N* acid to titrate in the cold in the presence of carbonates also was felt to be bad practice. The uncertainty of the results cast doubts on the use of the ABC steps in the calculation. Method 4 was eliminated as a separate method for the reason that it was similar to the recently proposed TAPPI Tentative Standard Method.

A number of different samples of mill green liquors were analyzed using titration methods 2, 3, and 5 after their true Na_2S and Na_2CO_3 contents had been established using the evolution reference methods. The results from this series of comparisons are shown in Table III.

In any consideration of the results shown in Table III, it should be recalled that the NaOH had been obtained by difference. Because of this fact, the values shown are dependent on the values for the other two constituents. A close examination of the results leads to the conclusion that the apparent Na_2S content varies inversely with NaOH content. This relationship is no doubt due to the fact that both Na_2S and NaOH are in effect determined by differences since the Na_2CO_3 is the only constituent determined independently by definite removal in one of the steps of the titration.

Consideration of the Na_2CO_3 results shows that method 2 gives consistently high results. The reason for this is not clear since the methods differ essentially only in the size of original sample taken and the normality of the acid used. Methods 3 and 5 show quite random deviations from the reference method.

Examination of the Na_2S contents shows at once that the "ABC" method of method 2 is very undesirable. The "BCD" variant of the same method shows close agreement with the reference method. Method 3 appears to give consistently low results while method 5 shows small random deviations.

With respect to the NaOH contents of the liquors examined, the "ABC" variant of method 2 is conspicuously out of agreement with the other values. The remaining three series of results show reasonable agreement.

In view of the evidence shown in Table III, the general statement can be made that the three variants of the differential titration will all give results well within practical limits if the "BCD" steps are used to compute the results. As evidence that the "ABC" variant of method 2 is being used, the recent paper by Hughey, Herndon, and Withrow *(11)* might be cited.

Table IV shows some comparative results on the analyses of mill white liquors. Again the results from the "ABC" variant of method 2 are in serious error. The "BCD" method of calculation, however, yields results in substantial agreement with the other two methods. The results in general indicate that the double titration methods will give slightly high results

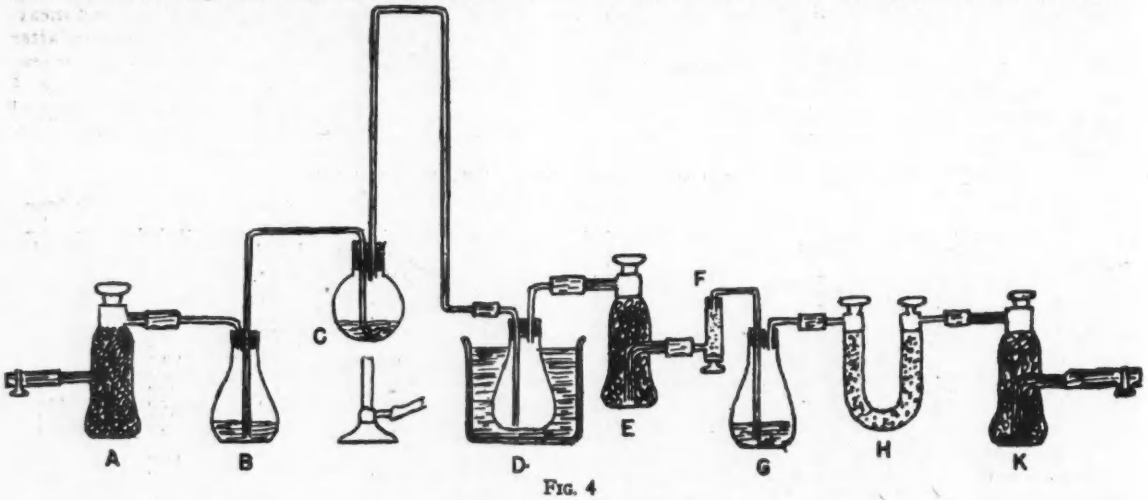

FIG. 4
Carbon Dioxide Evolution

for Na_2CO_3 contents and slightly low results for the Na_2S contents of white liquors.

With two of the three main constituents established by the use of independent reference methods, it was possible to calculate the caustic contents with considerable assurance of accuracy. The methyl orange titration on the sample precipitated with $BaCl_2$ should give results that are acceptable. In this step the main interfering compounds have been removed and the method as a whole is open to few valid criticisms. Accepting the "C" titration values as the most reliable of the titration results and substituting in the equation $C = Na_2S + NaOH$ the results for Na_2S obtained from use of the evolution methods, it was possible to calculate a "true" value for NaOH content.

In Table V these calculated values for NaOH content for the various samples of mill liquors are compared with the NaOH figure obtained from the "BCD" titration steps. A close examination of these comparative figures show that as far as caustic content is concerned, method 2 was somewhat closer to the "true" values than the other two methods. Method 5 shows modest random deviations from the "true" values. Method 3 seems to give consistently high results.

With the three main constituents of the mill liquors represented by "true" values, it was possible to calculate a combined figure representing total titratable alkali expressed as Na_2O. In Table VI these calculated or "true" total alkali figures are compared with the total titrable alkali using the "B" or methyl orange end point on the untreated sample results from the various titration methods. From the nature of this total alkali figure, it would be predicted that the inequalities between various methods would probably disappear. Examination of the results for total titrable alkali shows little choice between the various methods. The general disappearance of small differences between the various methods is probably due to compensation of small manipulation errors and to the fact that differences are involved that tend to compensate. A small or no difference at all between the calculated sum of "true" alkali and the titrated values "B" would indicate the absence of Na_2SO_3.

From the evidence at hand it would seem that the TAPPI Tentative Method gives results in closer agreement with the reference methods. The reasons for this closer agreement are not apparent. The only obvious explanation is that the TAPPI Tentative Method employs the most advantageous concentrations for the titration steps to minimize interference of carbonates. Also the influence of the undetermined constituents such as sulphites, silicates, etc. seems to be at a minimum. The analytical details making up the differences between the methods are small and at first glance they would not be expected to influence the results in a consistent manner.

Certain general observations obtained during the course of the present study seem worthy of record. These comments are made from the standpoint that the methods under discussion are to be used as routine control methods, often in the hands of persons having little technical training.

Method 3 as published does not specify the amount of $BaCl_2$ to be added to precipitate carbonates, sul-

TABLE IV.—COMPARATIVE TESTS ON MILL WHITE LIQUORS

	Evolution Method	Method 5	Deviation from Evolution Method	Method 3	Deviation from Evolution Method	Method 2	Deviation from Evolution Method	Method 2	Deviation from Evolution Method
Na_2CO_3, g./l.									
Jan. 20, 1944	27.9	30.7	+ 2.8	31.8	+ 3.9	31.9	+ 4.0		
Jan. 22, 1944	24.9	24.9	± 0.0	27.6	+ 2.7	28.4	+ 3.5		
Na_2S, g./l.									
Jan. 20, 1944	45.0	42.9	— 2.1	41.9	— 3.1	40.1	— 4.9	37.7	— 7.3
Jan. 22, 1944	38.7	35.5	— 3.2	33.7	— 5.0	37.8	— 0.9	32.5	— 6.2
NaOH, g./l.		BCD		BCD		BCD		ABC	
Jan. 20, 1944	....	106.8		106.3		110.0		113.8	
Jan. 22, 1944	....	105.0		101.0		103.4		109.2	

TABLE V.—SHOWING COMPARATIVE VALUES FOR NaOH CONTENT OF MILL LIQUORS WITH THE PROBABLE TRUE VALUE

	Method No. 5			Method No. 3			Method No. 2		
	NaOH Calculation g./l.	NaOH by Titration g./l.	Difference in Per Cent of Calculated Value	NaOH Calculation g./l.	NaOH by Titration g./l.	Difference in Per Cent of Calculated Value	NaOH Calculation g./l.	NaOH by Titration g./l.	Difference in Per Cent of Calculated Value
Green Liquors									
Dec. 21, 1943.....	23.0	24.0	+ 4.8	22.2	24.8	+11.7	22.6	22.8	+ 0.88
Jan. 4, 1944.....	21.9	19.2	— 7.8	23.1	23.3	+ 0.86	21.9	21.5	— 1.8
Jan. 10, 1944.....	22.6	21.2	— 5.8	21.0	21.0	± 0.0	23.5	22.4	— 4.7
Jan. 15, 1944.....	16.5	17.9	+ 8.5	16.0	20.8	+30.0	15.9	18.3	+15.0
Jan. 18, 1944.....	23.3	25.7	+10.6	22.3	27.1	+21.6	23.4	24.7	+ 5.5
White Liquors									
Jan. 20, 1944.....	101.5	106.8	+ 5.2	103.3	106.3	+ 3.2	106.5	110.0	+ 3.3
Jan. 22, 1944.....	103.3	105.0	+ 6.5	102.0	101.0	— 0.98	103.8	103.4	— 0.39

TABLE VI.—COMPARISON OF METHODS FOR TOTAL TITRABLE ALKALI (AS Na_2O)

	Method No. 5			Method No. 3			Method No. 2		
	Titrable Alkali Calculated g./l. Na_2O	Titrable Alkali Titration g./l. Na_2O	Difference in Per Cent of Calculated Value	Titrable Alkali Calculated g./l. Na_2O	Titrable Alkali Titration g./l. Na_2O	Difference in Per Cent of Calculated Value	Titrable Alkali Calculated g./l. Na_2O	Titrable Alkali Titration g./l. Na_2O	Difference in Per Cent of Calculated Value
Green Liquors									
Dec. 21, 1943	119.8	120.9	+ 0.16	119.2	119.0	— 0.16	119.5	121.2	+ 1.43
Jan. 4, 1944	117.3	116.5	— 0.68	118.2	118.1	— 0.09	117.3	119.3	+ 1.70
Jan. 10, 1944	117.8	119.7	+ 1.63	116.7	119.4	+ 2.33	118.6	120.9	+ 1.94
Jan. 15, 1944	111.9	106.8	— 4.55	111.5	106.8	— 4.20	111.5	108.6	— 2.60
Jan. 18, 1944	113.0	114.2	+ 1.06	112.2	113.8	+ 1.43	113.0	116.2	+ 2.80
White Liquors									
Jan. 20, 1944	129.5	134.9	+ 4.1	131.0	135.3	+ 3.30	133.2	137.0	+ 2.8
Jan. 22, 1944	122.7	124.3	+ 1.3	123.0	124.3	+ 1.06	124.3	127.1	+ 2.2

phites, and sulphates. It is felt that it is unwise to leave this point up to the judgment of the semi- or unskilled routine tester. A few trials will establish a sufficient amount of the reagent to take care of typical variations in a mill's liquor.

TAPPI Tentative Standard, T624 m-42, recommends the use of furfural in the titration, Step A, to the methyl orange end point. The milky condition caused by the addition of the relatively insoluble furfural to the sample makes it very difficult to detect the end point. In actual practice, the error due to uncertainty in the end point would be much more important than the accuracy that would be gained through the use of the aldehyde. Molzau, who originally recommended this step, apparently worked only with electro-metric titrations in which the obscuring of the color change at the end point would not be a factor.

The simplicity of the double titration for the routine analysis of kraft mill liquors is the main factor in its favor. The present study shows that certain limitations are inherent in the methods. The present results emphasize the dangers that can be encountered in changing analytical methods without the benefit of careful background work to evaluate such changes.

Literature Cited

1 Kress, Otto, *Paper* 17 No. 24:30, 32 (February 23, 1916).
2 Nielsen, "Paper Fabricant" Bd. II, S1 441, 1913, cited by Schwalbe-Sieber, p. 140.
3 Bergman, S. K., *Zellstoff u Papier*, Bd I, Nr. 4, S. 95-99, 1921.
4 Oeman, Erik, *Svensk Papp, Tidn*, Nr. 9, 10, 11, 1925, cited by same author in "Massanalytische Verfahren" S1, Carl Hoffman, Berlin.
5 Griffin, R. C., "Technical Methods of Analysis as Employed in the Laboratories of Arthur D. Little, Inc., Cambridge, Mass." p. 395-399; McGraw Hill Book Co., Inc., New York, 1927.
6 Moltzau, R. D., *Paper Trade J.* 115, No. 5:56-60 (July 30, 1942).
7 TAPPI Committee On Standard Methods, "Analysis of Sulphates in White and Green Liquors," TAPPI Tentative Standard T624m-42 *Paper Trade J.* 115, No. 11:30-32 (September 10, 1942).
8 Berl, E., Private Communication.
9 Schwalbe, C. G., and Sieber, R., "Die Chemische Betriebskontrolle in der Zellstoff u Papier Industrie," Julius Springer, Berlin, 1931.
10 Treadwell, F. P.; Hall, W. T., Analytical Chemistry, Vol. II, p. 615. John Wiley, Inc., New York, 1942.
11 Hughey, G. B.; Herndon, L. K., and Withro, J. R., *Paper Trade J.* 114 No. 9:105-112. (February 26, 1942).

Coating Committee Report, 1943-1944*

By Werner Kaufmann[1]

The members of the Coating Committee were selected not only for their knowledge of paper coating, but also from the geographic point of view, as all are either living in New York City, or within commuting distance from the city, and are, therefore able to attend the meetings of the Coating Committee regularly. Anyone who wishes to cooperate is welcome to attend the meetings. Since the Annual Meeting in February, 1943, there have been regular meetings once a month, or every five weeks. Besides, the regular Coating Committee there is an Advisory Committee consisting of a number of people interested in paper coating, and who are situated all over the United States of America. At almost every regular meeting, guests have been present who have contributed very valuable advice and suggestions.

During the TAPPI Meeting last September in Chicago, there was a very sucessful panel discussion on adhesives. This discussion was attended by over 300 people, and was extremely well arranged by a committee member, Mr. W. M. Bain.

As already mentioned in the report of last September, the Coating Committee has started a long-range program, which we hope will ultimately result in a monograph on the subject of paper coating. Coating pigments have been quite exhaustively studied and suppliers as well as users have been approached for their opinion and information on the subject of coating pigments. The committee is pleased to report that it has obtained some splendid replies, which now require editing and it is hoped that some time this year it will be possible to publish a monograph on paper coating. An excellent paper on the subject of calcium carbonate has been received.

Reports are welcome from all those who either use coating pigments or who have them for sale. However, this monograph on coating pigments is only one of the many phases of paper coating, and the ultimate purpose is to have a monograph on each one of the subjects as enumerated in the outline below.

Suggested Outline for Monograph on Paper Coating:

1. *Introduction.*
   Purpose and scope of the monograph.
2. *History and General Description of Paper Coating.*
   The origin, growth of paper coating, and general description and discussion of the varieties of coated paper, their classification, and uses.
3. *Raw Materials.*
   This section would be divided as follows, into two parts:
   (a) A series of articles fully covering each type of raw material, including a brief summary of the source, method of preparation, and physical and chemical properties, followed by a more detailed discussion of properties affecting paper coating, methods of use, etc.
   (b) A comprehensive tabulation of all materials, including trade names, manufacturer, and essential properties.
4. *Preparation and Formulation of Coating Colors.*
   A detailed description of the equipment and methods used for preparing coating colors, and a discussion of the variations required to obtain the desired end results. Typical detailed formulas should be given for several different grades of coated paper.
5. *Coating Processes and Equipment.*
   A series of articles covering the various coating processes (e.g., Roll, brush, air jet, machine, casting, etc.), including the drying operation.
6. *Finishing Operations and Equipment.*
   One or more articles covering the principal finishing operations, such as calendering, flint glazing, embossing, cutting, sorting, etc.
7. *Detailed Discussion of Specific Grades.*
   A series of articles each giving in detail the formulation, manufacturing procedure and special properties or requirements of the principal types of coated paper, including book, litho., fancy, protective, etc.
8. *Analysis and Testing.*
   A complete list of the commonly used tests and procedures, possibly giving details of those not covered by TAPPI standards.
9. *Statistics and Economic Trends.*
   Statistical data covering production by grades and processes, raw materials consumed, costs, etc. Future trends should be discussed.

One member of the Coating Committee will write, during the next 8 or 10 months, a paper relative to paragraph 5 of the outline, "Coating Processes and Equipment," and anyone who has any suggestions to make, is invited to get in touch with the Chairman of the Coating Committee as help is needed to accomplish the objective.

We hope to arrange for a monograph on the subject of "Viscosity," also to be written some time this year. Any one present who can help in the program is urged to assist with suggestions and with active cooperation.

The monthly meetings of the Coating Committee will be continued, and everyone is invited to attend.

At the Annual TAPPI Meeting, there was a discussion on the subject of "Post-War Aspects of Coating," in which twelve of the most outstanding experts on coating and coating materials took part.

* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 14-17, 1944.

[1] Member TAPPI; Chairman, TAPPI Coating Committee; Kupfer Bros. Co., New York, N. Y.

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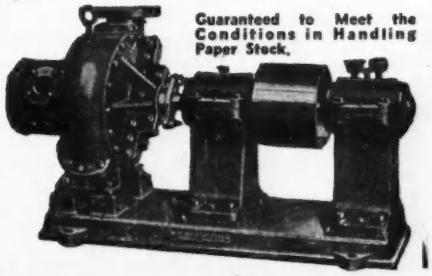

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Office of the PAPER TRADE JOURNAL.
Wednesday, July 5, 1944.

With the trend in the over-all production of paper for civilian use downward, concern about their ability to supply their customers' needs is reflected in current reports received from many manufacturers' representatives, jobbers, and general paper merchants. Total production of all types of paper for the first four months of 1944 was 5,675,000 tons, compared with 5,629,000 tons in 1943, an increase of 0.8%. Latest figures indicate less newsprint, book, fine, wrapping, and sanitary papers and that the output of setup box board will be substantially reduced.

The index of general business activity for the week ended June 24, declined to 143.6, from 144.0 for the previous week, compared with 137.4 for the corresponding week last year. The index of paper board production was 157.0, compared with 157.5 for the preceding week and with 145.9 for the corresponding week last year.

Paper production for the week ended June 24 was estimated at 92.4%, compared with 87.0% for 1943, with 84.5% for 1942, with 90.0% for 1941, and with 92.0% for the corresponding week in 1940.

Paper board production for the week ended June 24 was 96.0%, compared with 96.0% for 1943, with 72.0% for 1942, with 90.0% for 1941, and with 80.0% for the corresponding week in 1940.

Wood Pulp

Total supplies of wood pulp, as estimated by the WPB for the third quarter, will be somewhat over 2,830,000 tons, compared with 2,869,000 tons in the second quarter. The recommended program for the third quarter allocates 2,617,000 tons of pulp to paper and paper board, and 213,000 tons to non-paper uses and for export. Export requirements are reported to have been reduced from the second quarter, as Canada will assume obligations formerly fulfilled by this country.

Rags

Mill demand for new cotton cuttings is reported urgent and not entirely satisfied. All available supplies are being absorbed. Prices are strong at ceilings.

The old cotton rag market is active, with all grades in good, steady demand. The roofing grades are in heavy demand this week, with some mills reporting lack of supplies to meet their full requirements. Prices are firm at ceiling levels.

Old Rope and Bagging

War requirements of hard fibers, particularly No. 1 Manila rope, resulted in the issuance of WPB amendment Part 3281, Pulp and Paper, to Conservation Order M-294, on June 27, 1944. This order prohibits any person from selling waste Manila rope or fiber, if the seller has reason to believe such raw material will be used in the production of papers other than specified on List A. This classification includes insulating, gasket, artificial leather base papers, flour and cereal sack, tag papers, abrasive and stencil base types. List B includes condenser paper, not more than 18 pounds weight, 24 x 36.

Scrap bagging continues very slow. Demand is so extremely light that no definite price structure is determinable. Prices are nominal.

Old Waste Paper

Collections of waste paper are reported higher on an overall basis, despite the recent poor results reported in the Chicago drive. May collections are estimated at 600,000 tons, compared with 586,000 tons in April. May consumption is estimated at 613,000 tons. Total inventory is represented by 288,000 tons on May 30.

Demand for all grades of paper stock is active. Prices are firm at ceilings.

Twine

Demand is good for twine. No important change in this market has been reported during the week. Prices are quite firm at this date.

Pulpwood Prices Made Stricter

WASHINGTON, D. C., July 5, 1944 — Provisions permitting the addition of $1 a cord to the ceiling prices of pulpwood produced in the northeastern region of the United States, under certain conditions, have been made stricter to prevent abuses of this privilege, the Office of Price Administration announced today.

The change, which is effective July 10, 1944, allows this addition only when the producer can demonstrate that the added payment is necessary to cover unusual costs of operation. The payment cannot be made until prior approval has been obtained from the national OPA office. Applications for permission to pay the additional $1 a cord must include a statement prepared by the producer showing itemized unit costs, such as stumpage, cutting, yarding, woods hauling, trucking, construction and maintenance of improvements, and general overhead. A statement also must be submitted by the consuming mill as to why the additional payment is necessary. The application can be considered as approved if a notice to the contrary is not mailed within 15 days by OPA.

Previous provisions allowed the $1 addition when it was necessary to secure the wood for which the additional $1 per cord was being paid, and this was the least expensive means of securing the wood. Notice could be given to OPA either prior or subsequent to the payment, along with an itemized statement.

This flexible dollar provision, as it is known, appears only in the pulpwood regulation for the northeastern area, which comprises Maine, Vermont, New Hampshire, New York, and that portion of Connecticut and Massachusetts west of the Connecticut River. It was provided for that area, because conditions that prevail there are different from conditions in other areas and an additional payment is required for pulpwood operations because of such conditions as steep terrain, heavy snow and other difficulties. The $1 payment can be made only to a producer by a consuming mill.

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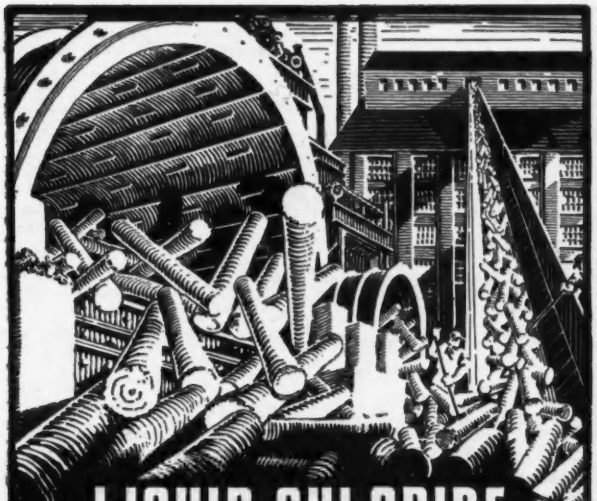

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This knife will cut straight as a die—check less than .001" variance across entire trim.
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DAYTON, OHIO

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL.
Wednesday, July 5, 1944.

BLANC FIXE—The market for blanc fixe continues to conform to prevailing quotations. Current demand fair. The pulp is currently quoted at $40 per ton, in barrels, at works; the powder is currently quoted at $60 per ton.

BLEACHING POWDER—Current demand is reported active. Supply situation reported satisfactory. Bleaching powder is currently quoted at from $2.50 to $3.10 per 100 pounds. All prices in car lots, in drums, f.o.b. works.

CASEIN—OPA maximum prices on processed acid-precipitated casein are as follows: 10,000 pounds or more, 25 cents per pound; 2,000 pounds, 24½ cents per pound; less than 2,000 pounds, 24¾ cents per pound, f.o.b. shipping point.

CAUSTIC SODA—Supply situation continues rather short, with production and demand reported heavy. Solid caustic soda is currently quoted at $2.30 per 100 pounds. The flake and ground are currently quoted at $2.70 per 100 pounds. All prices in car lots, in drums, f.o.b. works.

CHINA CLAY—Demand for some grades of china clay is reported moderate this week. Domestic filler clay is currently quoted at from $7.50 to 15 per ton; coating clay is quoted at from $12 to $22 per ton, at mines. Imported china clay is currently quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Production reported excellent. Demand for all uses heavy; most essential requirements fulfilled. Prices remain unchanged. Chlorine is quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b. works.

ROSIN—Lower prices are quoted on some grades of rosin this week: OPA ceiling price on "G" gum rosin is set at $5.75 per 100 pounds, in barrels, Savannah. "FF" wood rosin is currently quoted at $5.70 per 100 pounds in barrels, New York. Seventy per cent gum rosin is currently offered at $6.02 per 100 pounds, f.o.b. works.

SALT CAKE—Demand reported moderate. Quotations on salt cake continue to remain unchanged Domestic salt cake is currently quoted at $16 per ton.

SODA ASH—Market requirements for soda ash continue very heavy. Production reported high but demand is reported in excess of supply. Prices continue unchanged. Prices on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Corn is reported coming into market in larger volume, and industrial supply situation is encouraging. Quotations continue unchanged. Pearl is currently quoted at $3.72 per 100 pounds. The powdered grade is currently quoted at $3.83 per 100 pounds. All prices f.o.b. Chicago.

SULPHITE OF ALUMINA—Supply situation is reported satisfactory. Quotations unchanged. Prices on the commercial grades are quoted at from $1.15 to $1.25 per 100 pounds. The iron free is currently quoted at $2.35 per 100 pounds. All prices in car lots, in bags, f.o.b. works.

SULPHUR—Demand is reported steady for sulphur. Quotations on all grades continue unchanged. Annual contracts are currently quoted at $16 per long ton, f.o.b. mines. The current contract price at Gulf Ports remains unchanged at $17.50 per long ton.

TALC—The market for domestic talc is reported moderately active. Quotations unchanged. Domestic grades are quoted at from $16 to $21 per ton, at mines.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

Standard News, per ton—

Roll, contract...	*$58.00	@	—
Sheets	66.00		—

*OPA Maximum Price.

Kraft—per cwt.—Carload Quantities Zone A, f.o.b. Mill

Superstandard Wrapping	*$5.25	@	—
No. 1 Wrapping...	*5.00	"	—
Standard Wrapping	*4.75	"	—
Standard Bag.....	*4.375	"	—

*OPA Manufacturers' Prices.

Tissues—Per Ream—Carlots

White No. 1.....	1.12½	"	—
White No. 1 M. G.	1.10	"	—
White No. 1½....	1.00	"	—
White No. 2.....	.90	"	—
Anti-Tarnish M.F..	1.20	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—

Toilet—1 M. Sheets—Per Case

Unbleached	4.25	"	—
Bleached	5.70	"	—
Unbl. Toilet, 1 M.	4.16	"	—
Bleached Toilet...	5.70	"	—

Paper Towels, Per Case—

Unbleached, Jr.....	2.20	"	—
Bleached, Jr.....	3.20	"	—

Manila—per cwt.—C. l. f. a.

No. 1 Jute.....	11.25	@	—
No. 1 Manila Wrapping, 35 lb.....	6.00	"	6.25
No. 2 Manila Wrapping, 35 lb.....	5.75	"	6.00

Boards, per ton—

News	*48.00	@	—
Chip	*48.00	"	—
Sgl. Mla. Ll. Chip	*60.00	"	—
White Pat. Coated	*75.00	"	—
Kraft Liners 50 lb.	*63.00	"	—
Binders Boards....	84.00	"	116.00

*OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext.		
No. 1	$39.10@$46.00	$40.25@$47.25
100% Rag	32.20 " 37.75	33.35 " 39.25
85% Rag	.... "	29.90 " 35.00
75% Rag	23.00 " 27.00	24.15 " 28.25
65% Rag	.. "	22.80 " 27.75
50% Rag	18.70 " 22.75	19.90 " 24.25
25% Rag	16.40 " 20.00	17.55 " 21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items. Delivered in Zone 1:

	Bonds	Ledgers
No. 1	$10.55@$12.75	$11.70@$14.25
No. 2	9.65 " 11.75	10.80 " 13.25
No. 3	9.20 " 11.25	10.35 " 12.50
No. 4	8.90 " 10.75	10.05 " 12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper. Delivered in Zone 1:

No. 1 Glossy Coated...	$13.65	@$15.50
No. 2 Glossy Coated...	12.40	" 14.00
No. 3 Glossy Coated...	11.60	" 13.25
No. 4 Glossy Coated...	11.15	" 12.75
No. 1 Antique (watermarked)	10.25	" 11.75
No. 2 Offset.....	9.60	" 11.00
A Grade E. F.....	9.35	" 10.75
A Grade S. & S. C....	9.60	" 11.00
B Grade E. F.....	8.85	" 10.25
B Grade S. & S. C....	9.10	" 10.50
C Grade E. F.....	8.55	" 9.75
C Grade S. & S. C....	8.80	" 10.00
D Grade E. F.....	8.25	" 9.50
D Grade S. & S. C....	8.50	" 9.75

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight, Not Exceeding OPA Allowances.

Bl. Softwood Sulphite.....	$86.00
Unbl. Softwood Sulphite.....	74.00
Bl. Hardwood Sulphite.....	83.50
Unbl. Hardwood Sulphite.....	71.50
Unbl. Mitscherlich ... 72.00 @	82.00
N. Bleached Sulphate.....	86.00
S. Bleached Sulphate.....	79.00
N. Semi-Bleached Sulphate...	82.00
S. Semi-Bleached Sulphate....	75.00
N. Unbl. Sulphate.....	73.00
S. Unbl. Sulphate.....	63.50
Bl. Soda	72.00
Unbl. Soda	68.00
Groundwood	50.00

Transportation Allowances Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$13.50
Lake Central	13.50
Southern	16.00
West Coast (in area).....	10.50
West Coast (out area).....	16.50

	50%-80% Air Dry Weight
Northeast	$11.50
Lake Central	11.50
Southern	14.00
West Coast (in area).....	9.50
West Coast (out area).....	15.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weight
Northeast	$8.50
Lake Central	8.50
Southern	11.00
West Coast (in area).....	7.50
West Coast (out area).....	13.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum prices

Domestic Rags

New Rags (Prices to Mill f. o. b. N. Y.)

Shirt Cuttings— New White, No. 1..	6.50	@	7.25*
Silesias No. 1.....	—	"	5.75*
New Unbleached...	6.75	"	7.50*
Blue Overall.....	—	"	5.50*
Fancy	—	"	3.50*
Washables	—	"	3.00*
Bleached Khaki Cuttings	—	"	4.25*
Unbleached Khaki Cuttings	—	"	3.50*

*OPA Maximum Prices.

PRICE & PIERCE »»»»»»»ltd•

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60 East 42 Street
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West Virginia Pulp and Paper Company

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BLEACHED SULPHITE AND SODA PULP
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Old Rags

White, No. 1—			
Repacked	*3.80	"	—
Miscellaneous	*3.20	"	—
White, No. 2—			
Repacked	*2.90	"	—
Miscellaneous	*2.65	"	—
Third and Blues—			
Repacked	*2.20	"	—
Miscellaneous	*1.80	"	—
Roofing Rags—			
No. 1	*1.55	"	—
No. 2	*1.45	"	—
No. 3 (bagging)	*1.35	"	—
No. 4	*1.35	"	—
No. 5A	*1.35	"	—
Old Manila Rope	5.75	"	—

*OPA Maximum Prices.

Foreign Rags

All Prices nominal

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—
No. 4 White Linens	2.25	"	3.25
No. 1 White Cotton	4.25	"	4.75
No. 2 White Cotton	3.25	"	3.75
No. 3 White Cotton	2.50	"	3.00
No. 4 White Cotton	1.90	"	2.20
Extra Light Prints	2.00	"	2.40
Ord. Light Prints	1.75	"	2.15
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	3.00	"	—
Checks and Blues	2.00	"	—
Linsey Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shopperies	1.30	"	1.45
New Shopperies	1.45	"	1.50
French Blues	2.25	"	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	4.25	@	4.35
Wool Tares, light	4.25	"	4.50
Wool Tares heavy	4.50	"	5.00
Bright Bagging	4.50	"	4.85
Manila Rope—			
Foreign	—	"	—
Domestic	*5.75	"	—
Jute Threads	5.50	"	—
No. 1 Sisal Strings	*4.00	"	—
Mixed Strings	2.00	"	—

*OPA Maximum Price.

Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Envelope Cuts	3.12½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.67½	"	—
Mixed Books	.85	"	—
No. 1 White Ledger	2.17½	"	—
No. 2 Mixed Ledger, colored	1.87½	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.85	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
New Jute Corrugated Cuttings	.90	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.15	"	—
Box Board Cuttings	.72½	"	—
White Blank News	1.65	"	—
Overissue News	.85	"	—
No. 1 News	.75	"	—
No. 1 Mixed Paper	.70	"	—
Old Corrugated Containers	.82½	"	—
Mill Wrappers	.85	"	—

Twines

All Prices Nominal

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.21	@	—
White Hemp	.21	"	—
Fine Polished—			
Fine India	.26	"	—
Unpolished—			
Box	17¼	"	—
Paper Makers	.17	"	—
Tube Rope	.19	"	—
Wall Paper	.20½	"	—
Wrapping	.23	"	—
Soft Fiber Rope	.19	"	—
Cotton	.25	"	—

(Hard Fiber)

Medium Java	.18	"	—
Mex. Sisal	.16	"	—
Manila		"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill.)

Shirt Cuttings—	
New White No. 1	.07¼
New White No. 2	.05¾
Light Silesias	.05¾
Black Silesias, soft	.03¾
New Unbleached	.07½
Washable Prints	.04¼
Washable No. 1	.03
Blue Overall	.05½
Cottons—According to grades—	
Washable shredding	.01¾
Fancy Percales	.04¾
New Black Soft	.03¼
Khaki Cuttings—	
Unbleachable Cotton Cuttings	.03½
Bleachable Cotton Cuttings	.04¼
Men's Corduroy	.03½
Ladies' Corduroy	.03
Cottonades	.03¼

Domestic Rags (Old)

White No. 1 — Repacked	3.80	"	—
Miscellaneous No. 1	3.20	"	—
Miscellaneous No. 2	2.65	"	—
White No. 2 Repacked	2.90	"	—
Thirds and Blues—			
Miscellaneous	1.80	"	—
Repacked	2.20	"	—
Black Stockings—			
(Export)	Nominal		
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	1.55	"	—
Domestic No. 2	1.45	"	—
Roofing Bagging	1.35	"	—
Old Manila Rope	5.75	"	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	"	3.50
No. 1 Clean bright—			
Sisal Strings			.04
No. 2 Clean bright—			
Sisal Strings			.03
Sisal Jute	.02½	"	.02¾
Scrap—			
No. 1	3.25	"	3.30
No. 2	1.75	"	1.80
Wool Tares	4.00	"	4.25
No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers

(F. o. b. Phila)

OPA Maximum Prices

No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
Soft White Shavings, one cut	2.50	"	—
White Blank News	1.65	"	—
Soft White Shavings			
Mixed	2.15	"	—
No. 1 White Ledger	2.17½	"	—
No. 2 Ledger, colored	1.87½	"	—
No. 1 Heavy Books & Magazines	1.67½	"	—
Overissue Magazines	1.67½	"	—
New Manila Envelope Cuttings	2.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.70	"	—
Box Board Cuttings	.72½	"	—
Kraft Corrugated Cuttings	2.25	"	—
Old Corrugated Containers	1.15	"	—
Overissue News	.85	"	—
No. 1 News	1.00	"	—

BOSTON

Old Papers

(F. o. b. Boston)

OPA Maximum Prices

No. 1 Hard White Shavings, unruled	2.87½	@	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.67½	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White and Colored Tabulating Cards	2.25	"	—
Ground Wood Tabulating Cards	1.35	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.70	"	—
Overissue News	.85	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.15	"	—
Jute Corrugated Cuttings	1.07½	"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	—	@	2.75
Sisal Rope No. 1	*4.75	"	
Sisal Rope No. 2	*4.25	"	
Mixed Rope	—	"	1.55
Transmission Rope			
Foreign	(nominal)		
Domestic	2.75	"	3.00
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	5.25	"	—
Jute Cut Threads	3.00	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	—	"	2.50
South American	—	"	3.00

Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
No. 1 White Ledger	2.17½	"	—
No. 1 Heavy Books & Magazines	1.67½	"	—
White Blank News	1.65	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News	.85	"	—
No. 1 News	.75	"	—
No. 1 Mixed Paper	.70	"	—
No. 1 Roofing Rags	1.55	"	—
No. 1 Roofing Bags	1.45	"	—
Wool Tares—			
Foreign	(nominal)		
Domestic	4.25		
Aust. Wool Pouches	—	"	3.25
New Zealand Wool Pouches	—	"	3.50
New Burlap Cuttings	4.75	"	5.00
Heavy Baling Bagging	4.00	"	4.25
Paper Mill Bagging	2.50	"	3.00
No. 2 Roofing Bagging	1.35	"	—

*OPA Maximum Price

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.04½	@	.04¾
Fancy Percales	.04¾	"	.05
New White No. 1	.06¾	"	.07
New Light Flannelettes	05½	"	.06
Canton Flannels, Bleached	06	"	06¼
Underwear Cutters, Bleached	06¾	"	06¾
Underwear Cutters, Unbleached	05¾	"	06
Silesias No. 1	06	"	06¼
New Black Silesias	03	"	.03¾
Red Cotton Cuttings	03½	"	.04
Soft Unbleached	06½	"	06¾
Blue Cheviots	05½	"	.06
Fancy	02¾	"	—
Washable	.02¾	"	—
Khaki Cuttings	02¾	"	.03
O. D. Khaki	.03½	"	.03¾
Corduroy	.03¾	"	.04
New Canvas	.06¼	"	.06½
B. V. D. Cuttings	06¼	"	06½

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	@	—
Miscellaneous	3.20	"	—
White No. 2—			
Miscellaneous	2.65	"	—
Twos and Blues, Repacked	2.20	"	—
Old Blue Overalls	2.25	"	4.50
Thirds and Blues Repacked	2.20	"	—
Miscellaneous	1.80	"	—
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.55	"	—
No. 2	1.45	"	—
No. 3	1.35	"	—
No. 4	1.35	"	—
No. 5, Quality A	1.35	"	—
Quality B	1.20	"	
Quality C	.95	"	—
Old Manila Rope	5.75	"	

*OPA Maximum Prices

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

No. 1 White Ledger	2.17½	"	—
No. 1 Heavy Books & Magazines	1.67½		—
White Blank News	1.65		—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News	.85	"	—
No. 1 News	.75	"	—
No. 1 Mixed Paper	.70	"	—
No. 1 Roofing Rags	1.55	"	—
No. 1 Roofing Bags	1.45	"	—